

生态规划与绿色建筑教育部重点实验室
**Key Laboratory of Eco Planning & Green Building,
Ministry of Education**

年报
Annual Report

2014

清华大学

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第一部分 生态规划与绿色建筑教育部重点实验室简介

前言

生态规划与绿色建筑教育部重点实验室于2008年通过教育部论证成立，依托清华大学开展建设，发挥了清华大学在城市可持续发展、生态规划和绿色建筑技术领域的国内乃至世界领先优势，集中了清华大学在这一研究领域的精华力量。根据中国城镇化的发展趋势和国家中长期科技发展战略需求，实验室以人居环境科学理论为基础，通过建筑学、规划学、景观学、生态学、地理学、社会学、建筑技术科学等多学科融贯交叉，确立了五大研究方向。实验室自成立以来，一直积极贯彻落实国家开展城镇化建设和城市发展的方针，致力于城市可持续发展、生态规划和绿色建筑技术的研究，注重国内外的交流与合作，支持和参与了国家绿色建筑标识的研究，发表了以上领域的多篇学术论文，获得了一批受国内外同行认可的重要理论和应用成果，产生了显著的经济和社会效益。

主要研究方向和目标

在实验室的发展规划中，重点强调：

1. 依托清华大学学科交叉综合、人才资源丰富等优势，抓住城镇化和城市发展中的生态、绿色、低碳和节能环保领域新兴研究方向，积极拓宽学科发展领域，构建国际领先的国家级人居环境科学科研平台，培养多样化的人居环境科学高层次人才。

2. 以国家重大工程需求为导向，努力营造有利于基础性原始创新、成果转化的应用性创新和集成综合创新的科研和学科建设环境。

3. 推进国内、国际合作，共同承担国家级前瞻性课题、国家重大项目、国家科技攻关等重大科研任务。开展与国际知名科研机构的合作，积极参与全球性国际合作项目。

实验室主要研究方向包括：

1. 人居环境协调机理和功能系统模型研究
2. 城乡生态规划与生态建设关键技术研究
3. 生态城市与绿色建筑模拟、评价和保障技术研究
4. 地区生态诊断与生态修复技术研究

5. 绿色建筑设计及评价理论研究

实验室机构组成

实验室： 主 任：尹 稚 教授 清华大学建筑学院

副主任：朱颖心 教授 清华大学建筑学院

学术委员会：

| 姓名 | 职责 | 职称/职务 | 工作单位 |
|-----|-------|--------------------|-----------------|
| 吴良镛 | 名誉主任 | 中国科学院院士 中国工程院院士 | 清华大学 |
| 邹德慈 | 名誉副主任 | 中国工程院院士 | 中国城市规划设计研究院 |
| 秦佑国 | 主任 | 教授，博导 | 清华大学 |
| 陈宜明 | 委员 | 教授级高工，司长 | 住房和城乡建设部科技与节能司 |
| 江 亿 | 委员 | 中国工程院院士 | 清华大学 |
| 陈晓丽 | 委员 | 教授级高工，总工 | 中国风景园林学术理事长 |
| 唐 凯 | 委员 | 教授级高工 | 住房和城乡建设部，总规划师 |
| 张 泉 | 委员 | 教授级高工 | 中国城市规划学会副理事长 |
| 杨保军 | 委员 | 教授级高工 | 中国城市规划设计研究院，副院长 |
| 徐 雷 | 委员 | 教授，博导 | 浙江大学 |
| 李兵弟 | 委员 | 教授级高工，主任 | 建设部村镇建设办公室 |
| 沈清基 | 委员 | 教授，博导 | 同济大学 |
| 刘加平 | 委员 | 中国工程院院士，教授 | 西安建筑科技大学 |
| 林海燕 | 委员 | 教授级高工，副院长 | 中国建筑科学研究院 |
| 李 强 | 委员 | 教授，院长 | 清华大学 |

第二部分 生态规划与绿色建筑教育部重点实验室年度报告

一、队伍建设和人才培养

实验室现有固定成员 48 人，包括：长江学者特聘教授 1 人，国家杰出青年基金获得者 3 人，国家优秀青年基金获得者 3 人（刘晓华为 2014 年度荣获），新世纪人才 6 人，国家“百千万人才工程”培养人选 1 人，入选中组部首批“万人计划”科技创新领军人才 1 人，入选中组部“万人计划”科技创新领军人才 1 人（林波荣，2014 年度入选）。

博士研究生和硕士研究生及其他流动人员是我室进行科研工作的主要力量，实验室设有建筑学一级学科硕士点、博士点、博士后流动站，以及二级学科供热供燃气通风与空调硕士点和博士点，及土木工程专业博士后流动站。2014 年共 12 个博士后出站，17 人获得博士学位，42 人获得硕士学位。

1. 固定成员一览表

| 序号 | 姓名 | 类型 | 性别 | 学位 | 职称 | 出生年 | 在实验室工作年限 |
|----|-----|------|----|----|-----|------|----------|
| 1 | 尹稚 | 研究人员 | 男 | 博士 | 教授 | 1961 | 2013—至今 |
| 2 | 顾朝林 | 研究人员 | 男 | 博士 | 教授 | —— | 2013—至今 |
| 3 | 党安荣 | 研究人员 | 男 | 博士 | 教授 | 1964 | 2013—至今 |
| 4 | 田莉 | 研究人员 | 女 | 博士 | 教授 | —— | 2013—至今 |
| 5 | 林文棋 | 研究人员 | 男 | 博士 | 副教授 | 1969 | 2013—至今 |
| 6 | 黄鹤 | 研究人员 | 女 | 博士 | 副教授 | —— | 2013—至今 |
| 7 | 唐燕 | 研究人员 | 女 | 博士 | 副教授 | —— | 2013—至今 |
| 8 | 张悦 | 研究人员 | 男 | 博士 | 教授 | 1973 | 2013—至今 |
| 9 | 刘宛 | 研究人员 | 女 | 博士 | 副教授 | 1972 | 2013—至今 |
| 10 | 胡洁 | 研究人员 | 男 | 博士 | 高工 | 1960 | 2013—至今 |
| 11 | 袁昕 | 研究人员 | 男 | 博士 | 高工 | 1966 | 2013—至今 |
| 12 | 朱颖心 | 研究人员 | 女 | 博士 | 教授 | 1959 | 2013-至今 |
| 13 | 张寅平 | 研究人员 | 男 | 博士 | 教授 | 1962 | 2013-至今 |
| 14 | 杨旭东 | 研究人员 | 男 | 博士 | 教授 | 1966 | 2013-至今 |

| 序号 | 姓名 | 类型 | 性别 | 学位 | 职称 | 出生年 | 在实验室 工作年限 |
|----|-----|------|----|----|-------|------|--------------|
| 15 | 李先庭 | 研究人员 | 男 | 博士 | 教授 | 1967 | 2013-至今 |
| 16 | 付林 | 研究人员 | 男 | 博士 | 教授 | 1968 | 2013-至今 |
| 17 | 林波荣 | 研究人员 | 男 | 博士 | 教授 | 1976 | 2013-至今 |
| 18 | 赵彬 | 研究人员 | 男 | 博士 | 教授 | 1974 | 2013-至今 |
| 19 | 王馨 | 研究人员 | 女 | 博士 | 副教授 | 1974 | 2013-至今 |
| 20 | 李晓峰 | 研究人员 | 男 | 博士 | 副教授 | 1973 | 2013-至今 |
| 21 | 燕达 | 研究人员 | 男 | 博士 | 副教授 | 1978 | 2013-至今 |
| 22 | 张昕 | 研究人员 | 男 | 博士 | 副教授 | 1977 | 2013-至今 |
| 23 | 燕翔 | 研究人员 | 男 | 博士 | 副教授 | 1972 | 2013-至今 |
| 24 | 莫金汉 | 研究人员 | 男 | 博士 | 副教授 | 1980 | 2013-至今 |
| 25 | 恽爽 | 管理人员 | 女 | 硕士 | 教授级高工 | 1975 | 2013—至今 |
| 26 | 郑晓津 | 管理人员 | 女 | 硕士 | 高级工程师 | 1974 | 2013—至今 |
| 27 | 潘芳 | 管理人员 | 女 | 硕士 | 高级工程师 | 1976 | 2013—至今 |
| 28 | 吕舟 | 管理人员 | 男 | 硕士 | 教授 | 1959 | 2013—至今 |
| 29 | 张杰 | 管理人员 | 男 | 博士 | 教授 | 1963 | 2013—至今 |
| 30 | 刘晓华 | 研究人员 | 女 | 博士 | 教授 | 1980 | 2013—至今 |
| 31 | 魏庆芑 | 管理人员 | 男 | 博士 | 副研究员 | 1974 | 2013—至今 |
| 32 | 夏建军 | 管理人员 | 男 | 博士 | 副教授 | 1975 | 2013—至今 |
| 33 | 霍晓卫 | 研究人员 | 男 | 博士 | 高级规划师 | 1975 | 2013—至今 |
| 34 | 郑晓笛 | 研究人员 | 女 | 博士 | 副教授 | 1977 | 2013—至今 |
| 35 | 刘畅 | 研究人员 | 男 | 博士 | 副教授 | —— | 2013—至今 |
| 36 | 邵磊 | 研究人员 | 男 | 博士 | 副教授 | 1973 | 2013—至今 |
| 37 | 刘海龙 | 研究人员 | 男 | 博士 | 副教授 | —— | 2013—至今 |
| 38 | 宋晔皓 | 研究人员 | 男 | 博士 | 教授 | 1970 | 2013—至今 |
| 39 | 张利 | 研究人员 | 男 | 博士 | 教授 | 1970 | 2013—至今 |
| 40 | 刘念雄 | 研究人员 | 男 | 博士 | 教授 | 1970 | 2013—至今 |
| 41 | 姜涌 | 研究人员 | 男 | 博士 | 副教授 | 1970 | 2013—至今 |
| 42 | 周正楠 | 研究人员 | 男 | 博士 | 副教授 | 1973 | 2013—至今 |

| 序号 | 姓名 | 类型 | 性别 | 学位 | 职称 | 出生年 | 在实验室 工作年限 |
|----|-----|------|----|----|-------|------|--------------|
| 43 | 程晓喜 | 研究人员 | 女 | 博士 | 副教授 | 1978 | 2013—至今 |
| 44 | 韩孟臻 | 研究人员 | 男 | 博士 | 副教授 | 1975 | 2013—至今 |
| 45 | 张弘 | 研究人员 | 男 | 博士 | 副教授 | 1977 | 2013—至今 |
| 46 | 黄蔚欣 | 研究人员 | 男 | 博士 | 副教授 | 1975 | 2013—至今 |
| 47 | 荣浩磊 | 管理人员 | 男 | 博士 | 教授级高工 | 1973 | 2013—至今 |
| 48 | 邹涛 | 管理人员 | 男 | 博士 | 高级工程师 | 1977 | 2013—至今 |

2. 科技人才情况一览表

| 名称 | 姓名（获得时间） |
|-------------------|--|
| 院士 | |
| 千人计划 | |
| 长江学者 | 杨旭东（2005） |
| 国家杰出青年基金 | 顾朝林（2000）；张寅平（2007），李先庭（2011） |
| 青年千人计划 | |
| 国家优秀青年基金 | 田莉（2012）；林波荣（2012）；刘晓华（2014） |
| 新世纪人才 | 李先庭（2005）；赵彬（2007）；付林（2009）；王馨（2009）；刘晓华（2011） |
| 百千万人才工程 | 顾朝林（2000） |
| 科技部中青年科技创新领军人才计划 | 林波荣（2013） |
| 中组部“万人计划”科技创新领军人才 | 林波荣（2014） |

3. 国内外学术组织和国内外杂志任职情况一览表

| 姓名 | 组织/杂志 | 职位 |
|----|-------------------------------|------|
| 尹稚 | 中国城市规划学会 | 副理事长 |
| | 《城市规划》、《城市规划学刊》、《国际城市规划》、《风景园 | 编委 |

| 姓名 | 组织/杂志 | 职位 |
|-----|--|----------|
| | 林》 | |
| | 《城市与区域规划研究》 | 副主编 |
| | 《北京规划建设》 | 特邀理事 |
| | 《中国城市规划建设知识仓库 (ccpd)》 | 编辑委员会副主任 |
| 朱颖心 | 全国高等学校建筑环境与设备工程学科专业指导委员会 | 主任委员 |
| | 住建部高等教育建筑环境与设备工程专业评估委员会 | 副主任委员 |
| | 北京土木建筑学会暖通空调专业委员会 | 副主任委员 |
| | Building Environment、Energy and Building、Journal of Asia Architecture and Building Engineering、Building Simulation、Journal of Building Performance Simulation、International Journal of Sustainable Building Technology and Urban Development | 国际学术期刊编委 |
| | 国际建筑性能模拟学会 (IBPSA) | 理事会中国代表 |
| | 国际室内空气品质科学院 | 特别会员 |
| 顾朝林 | 中国地理学会 | 副理事长 |
| | 中国城市规划学会、中国地名与行政区划学会 | 常务理事 |
| | 建设部城乡规划专家委员会、建设部城市规划专业评估委员会 | 委员 |
| | 中国城市科学研究会 | 理事 |
| | 教育部地理学教学指导委员会、建设部城市规划专业教学指导委员会 | 副主任 |
| | Urban China Network | 成员 |
| | 《International Journal of Urban and Regional Research》、《地理学报》、《城市规划》、《地理研究》、《地理科学》、《经济地理》、《人文地理》、《长江流域资源与环境》、《地理科学进展》、《城市规划学刊》、《规划师》、《华中建筑》 | 编委 |
| 党安荣 | 《遥感学报》、《地球信息科学学报》 | 编委 |
| 林文棋 | 中国城市规划学会城市生态规划建设学术委员会；中国生态 | 委员 |

| 姓名 | 组织/杂志 | 职位 |
|-----|----------------------------------|-----------------|
| | 学学会景观生态专业委员会；中国城市科学研究会生态城市专业委员会 | |
| | 《国际城市规划》、《小城镇建设》 | 编委 |
| 田莉 | 雄安新区规划评议专家组 | 专家 |
| | 剑桥海外基金会 | 研究员 |
| | 中国区域科学协会 | 理事 |
| | 中国城市科学研究会新型城镇化与城乡规划专业学术委员会 | 常务副主任委员 |
| 李先庭 | 国际制冷学会 E1 委员会 | 主席 |
| | 中国制冷学会 | 副理事长 |
| | 北京制冷学会 | 副理事长 |
| | 中国制冷学会空调热泵专业委员会和科普工作委员会 | 副主任委员 |
| | 中国制冷空调工业协会热泵分会和专家委员会 | 副理事长、主任 |
| | 全国暖通空调学会通风专业委员会 | 主任委员 |
| | 中国勘察设计协会建环分会 | 常务理事 |
| | 全国高等学校建筑环境与能源应用工程学科专业指导委员会和评估委员会 | 委员 |
| | 全国暖通空调及净化设备标准化技术委员会 | 委员 |
| | CAR-ASHRAE Beijing Group | 负责人 |
| | Indoor and Built Environment | Regional Editor |
| 张寅平 | 中国环境学会室内环境与健康专业委员会 | 主任委员 |
| | 住房与城乡建设部建筑环境与节能标准化技术委员会 | 副主任委员 |
| | 中国建筑学会零能耗建筑学术委员会 | 副主任委员 |
| | 中国环境科学学会 | 常务理事 |
| | 中国工程热物理学会传热传质专业委员会 | 委员 |
| | 中国建筑学会建筑物理专业委员会 | 委员 |
| | 中国建筑学会暖通空调专业委员会 | 委员 |
| | 中国健康建筑产业技术创新战略联盟技术委员会 | 主任委员 |

| 姓名 | 组织/杂志 | 职位 |
|-----|-----------------------------------|-------------------|
| | 国际室内空气科学院 | 会士 |
| | Energy and Buildings | 副主编 |
| | Indoor Air | 编委 |
| | Building and Environment | 编委 |
| | PLoS ONE | 编委 |
| | Frontier of Architecture Research | 编委 |
| | 科学通报 | 编委 |
| | 太阳能学报 | 编委 |
| | 暖通空调 | 编委 |
| 莫金汉 | 中国环境科学学会室内环境与健康分会青委会 | 主任 |
| | 全国暖通空调学会两委会通风专业委员会 | 委员 |
| 王馨 | Indoor and built environment | 编委 |
| 杨旭东 | 《Building Simulation》 | 创始人、主编 |
| | 《Building and Environment》 | 副主编 |
| | 国际能源署建筑与社区节能委员会 (IEA-EBC) | 执委会委员 |
| | 美国供热、制冷和空调工程师学会 (ASHRAE) | FELLOW, 研究管理委员会委员 |
| 付林 | 中国城镇供热协会技术委员会 | 委员 |
| | 北京供热协会技术委员会 | 副主任委员 |
| | 中国建筑学会建筑热动力分会 | 理事 |
| | 中国电机工程学会热电专业委员会 | 委员 |
| | 《暖通空调》 | 编委 |
| | 《区域供热》 | 编委 |
| | 《热电技术》 | 编委 |
| 林波荣 | 中国绿色建筑与节能专业委员会委员兼青年委员会 | 主任 |
| | 住房和城乡建设部绿色建筑评价标识专家委员会 | 委员 |
| | 中国建筑学会建筑物理分会 | 理事 |
| | 中国环境科学学会室内环境与健康分会 | 理事 |

| 姓名 | 组织/杂志 | 职位 |
|-----|--------------------------------|---------|
| | 国际建筑性能模拟学会(IPBSA) | 委员 |
| | 《生态城市与绿色建筑》 | 副主编 |
| | 北京市绿色建筑促进会 | 副秘书长 |
| | 北京市可持续发展促进会 | 副秘书长/理事 |
| | 国家环保总局环境认证中心 | 特聘专家 |
| | 深圳市建筑节能与绿色建筑重点实验室 | 特聘专家 |
| 赵彬 | 国际室内空气质量科学院 (Academy of ISIAQ) | 会士 |
| | Building simulation | 副主编 |
| 恽爽 | 中国城市规划学会城市设计学术委员会 | 委员 |
| | 中国城市规划学会青年工作委员会 | 委员 |
| | 北京城市规划学会城市更新与规划实施学术委员会 | 首席专家 |
| 潘芳 | China City Planning Review | 编委 |
| 吕舟 | 清华大学国家遗产中心 | 主任 |
| | 中国文物古迹保护协会 (ICOMOS-CHINA) | 副主席 |
| | 中国世界文化遗产专家委员会 | 副主席 |
| | 中国紫禁城学会 | 副理事长 |
| | 中国建筑学会建筑史学分会 | 理事长 |
| 张杰 | 中国古迹遗址保护协会 | 常务理事 |
| | 中国古迹遗址保护协会历史村镇专业委员会 | 主席 |
| | ICOMOS 历史村镇委员会 | 执行委员 |
| | 中国文物学会历史文化名街委员会 | 会长 |
| | 中国建筑学会城乡建成遗产学术委员会 | 副理事长 |
| | 中国城市规划学会 | 理事 |
| | 中国城市科学委员会历史文化名城委员会 | 常务委员 |
| | 中国城市规划学会历史文化名城学术委员会 | 副主任委员 |
| | 中国城市规划学会城市设计学术委员会 | 委员 |
| 夏建军 | Building Simulation | 主编助理 |
| | 《区域供热》杂志 | 副主编 |

| 姓名 | 组织/杂志 | 职位 |
|---|--|-------------------|
| | 国际能源机构集中供热供冷组织 IEA DHC | 中方代表 |
| 郑晓笛 | 国际风景园林师联合会亚太区(IFLA APR) | 中国代表 |
| 郑晓笛 | LILA 国际景观奖(Landezine International Landscape Award) | 评委 |
| 郑晓笛 | 中国科协国际民间科技组织 | 后备专家 (中国风景园林学会推荐) |
| | 《城市设计》杂志 | 编委 |
| | 《风景园林》 | 特约编辑 |
| | 《中国园林》 | 审稿人 |
| | 《景观设计学》 | 审稿人 |
| | 《世界建筑》 | 英文审校 |
| | 《世界园林》 | 国际部主任 |
| | 中国花卉园艺与园林绿化行业协会 | 国际交流部主任 |
| | 中国风景园林学会 | 会员 |
| | 美国风景园林师协会 (American Society of Landscape Architects) | 会员 |
| | 宋晔皓 | 中国建筑学会建筑师分会 |
| 中国建筑学会寒地建筑学术委员会 | | 理事 |
| 全国高等学校建筑学学科专业指导委员会建筑技术教育工作委员会 | | 副主任 |
| 中国绿色建筑委员会绿色建筑理论与实践组 | | 常务副组长 |
| 中国建筑学会建筑师分会建筑技术专业委员会 | | 主任 |
| 中国建筑学会主动式建筑学术委员会 | | 副主任 |
| 生态城市与绿色建筑 | | 副主编 |
| Building and Environment、Energy and Building 等 SCI 检索期刊 | | 审稿人 |
| 黄蔚欣 | 全国高等学校建筑学专业教育指导委员会建筑数字技术教学工作委员会 | 副主任委员 |

| 姓名 | 组织/杂志 | 职位 |
|----|-----------------------------|-------------|
| | 亚洲计算机辅助建筑设计学会（CAADRIA） | 委员会成员，财务委员 |
| | 中国建筑学会建筑师分会数字建筑设计专业委员（DADA） | 联合发起人，委员会委员 |
| | 中国环境行为学会（EBRA） | 委员会成员 |
| | 中国建筑学会建筑结构分会新材料及新型结构专业委员会 | 委员会成员 |

4. 研究生培养统计表

(1) 博士生培养一览表

| 序号 | 学号 | 姓名 | 导师姓名 | 专业 |
|----|------------|-----------|------|------|
| 1 | 2008310024 | 傅强 | 顾朝林 | 城市规划 |
| 2 | 2005380001 | 荣山庆二 | 吕舟 | 建筑学 |
| 3 | 2006310004 | 景峰 | 吕舟 | 建筑学 |
| 4 | 2008310006 | 乌布里 买买提艾力 | 吕舟 | 建筑学 |
| 5 | 2008310007 | 吕宁 | 吕舟 | 建筑学 |
| 6 | 2008380004 | 车周焕 | 吕舟 | 建筑学 |
| 7 | 2009310004 | 刘祎绯 | 吕舟 | 建筑学 |
| 8 | 2010310010 | 朱宇华 | 吕舟 | 建筑学 |
| 9 | 2005310028 | 黄少丹 | 张寅平 | 土木工程 |
| 10 | 2007310026 | 孙健 | 付林 | 土木工程 |
| 11 | 2007310029 | 邵晓亮 | 李先庭 | 土木工程 |
| 12 | 2007310031 | 刘巍巍 | 张寅平 | 土木工程 |
| 13 | 2008310034 | 张晓灵 | 李先庭 | 土木工程 |
| 14 | 2008310036 | 刘聪 | 张寅平 | 土木工程 |
| 15 | 2009310027 | 黄莉 | 朱颖心 | 土木工程 |
| 16 | 2009310029 | 蔚文娟 | 张寅平 | 土木工程 |
| 17 | 2009310031 | 王超 | 杨旭东 | 土木工程 |

(2) 硕士生培养一览表

| 序号 | 学号 | 姓名 | 导师姓名 | 专业 |
|----|------------|-----|------|------|
| 1 | 2012210074 | 邢腾 | 张悦 | 城市规划 |
| 2 | 2012210076 | 黄琦 | 尹稚 | 城市规划 |
| 3 | 2012210079 | 陈海江 | 尹稚 | 城市规划 |
| 4 | 2012210081 | 郭昊 | 张悦 | 城市规划 |
| 5 | 2012210083 | 李家琪 | 尹稚 | 城市规划 |
| 6 | 2011210025 | 刘峻宇 | 张杰 | 工学 |
| 7 | 2012210038 | 陈安琪 | 张杰 | 工学 |
| 8 | 2011210007 | 王帅 | 吕舟 | 工学 |
| 9 | 2011210013 | 李紫薇 | 林波荣 | 工学 |
| 10 | 2011210022 | 李卉 | 燕翔 | 工学 |
| 11 | 2011270022 | 何孟哲 | 吕舟 | 工学 |
| 12 | 2009270024 | 王礼文 | 张利 | 建筑学 |
| 13 | 2011210009 | 唐漫 | 刘念雄 | 建筑学 |
| 14 | 2011270021 | 钟永男 | 吕舟 | 建筑学 |
| 15 | 2012210008 | 刘诗晴 | 李晓东 | 建筑学 |
| 16 | 2012210045 | 袁晓宇 | 张利 | 建筑学 |
| 17 | 2012210048 | 冯思婕 | 刘念雄 | 建筑学 |
| 18 | 2012210056 | 朱琳 | 张利 | 建筑学 |
| 19 | 2012210062 | 张丙生 | 李晓东 | 建筑学 |
| 20 | 2012270001 | 汪晓萌 | 李晓东 | 建筑学 |
| 21 | 2012280190 | 安琪 | 李晓东 | 建筑学 |
| 22 | 2012280191 | 赫瑞 | 张利 | 建筑学 |
| 23 | 2012280193 | 林秀玲 | 张悦 | 建筑学 |
| 24 | 2012280196 | 林秀芳 | 李晓东 | 建筑学 |
| 25 | 2012280198 | 王于珊 | 黄鹤 | 建筑学 |
| 26 | 2012280199 | 杜嘉阳 | 张利 | 建筑学 |

| 序号 | 学号 | 姓名 | 导师姓名 | 专业 |
|----|------------|-----|------|-----|
| 27 | 2012280201 | 奈拉 | 林波荣 | 建筑学 |
| 28 | 2012280204 | 娜菲斯 | 李晓东 | 建筑学 |
| 29 | 2012280205 | 刘李心 | 李晓东 | 建筑学 |
| 30 | 2012280252 | 黄筠淳 | 黄鹤 | 建筑学 |
| 31 | 2012280301 | 钟文诗 | 张利 | 建筑学 |
| 32 | 2009210053 | 滕小果 | 王馨 | 工学 |
| 33 | 2009310028 | 熊双 | 李先庭 | 工学 |
| 34 | 2011210044 | 卓思文 | 王馨 | 工学 |
| 35 | 2011210046 | 张崎 | 燕达 | 工学 |
| 36 | 2011210047 | 江晶晶 | 刘晓华 | 工学 |
| 37 | 2011210050 | 王硕 | 魏庆芑 | 工学 |
| 38 | 2011210051 | 李睦 | 张寅平 | 工学 |
| 39 | 2011210052 | 祝侃 | 夏建军 | 工学 |
| 40 | 2011210053 | 杜正健 | 张寅平 | 工学 |
| 41 | 2011210054 | 李政 | 杨旭东 | 工学 |
| 42 | 2011280124 | 郑博伦 | 朱颖心 | 工学 |

5. 博士后培养统计表

| 序号 | 姓名 | 合作导师 | 进站日期 | 出站日期 |
|----|---------|------|----------|----------|
| 1 | 边海军 | 付林 | 20111221 | 20140307 |
| 2 | 崔海玉（韩国） | 顾朝林 | 20120309 | 20140404 |
| 3 | 王嘉亮 | 宋晔皓 | 20111115 | 20140417 |
| 4 | 杜世元 | 张寅平 | 20120412 | 20140421 |
| 5 | 余娟 | 朱颖心 | 20120413 | 20140505 |
| 6 | 翟飞 | 吕舟 | 20101213 | 20140512 |
| 7 | 邓翔宇 | 朱颖心 | 20111219 | 20140513 |
| 8 | 姜云涛 | 付林 | 20110314 | 20140520 |
| 9 | 吴世江（在职） | 尹稚 | 20111227 | 20140522 |

| | | | | |
|----|---------|----|----------|----------|
| 10 | 杨红梅 | 张杰 | 20111221 | 20140522 |
| 11 | 宁小卓（企业） | 吕舟 | 20121103 | 20141223 |
| 12 | 曹彬 | 张杰 | 20120918 | 20141226 |

二、研究水平与贡献

1. 主要研究成果与贡献

实验室在 2014 年度的主要研究成果 10 项，详情如下：

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
|--|------------------|------|-------------------|---------------|--------|
| 1 | 广州南沙新区总体概念规划国际咨询 | 研究报告 | 北京清华同衡规划设计研究院有限公司 | 尹稚（1）、林文棋（2） | 2014 |
| <p>本次规划注重概念策划与理性分析，规划提出四大设计理念，实现智慧、休闲、生态、文化四位一体理念。从宏观政策、市场环境到城市建设技术动态多层次解读南沙新区发展背景及需求，确定南沙新区将建设成为新时期具有典范作用的国家级新区。这个发展定位即满足了国家战略要求，呼应了区域发展的诉求，同时能够体现广州和南沙自身的发展需求和梦想，得到了各方的认同。规划研究强调从"发展模式-规划理念-空间范式-系统导控"一以贯之的严密解决思路。规划设计强调从关注物质空间本身向关注空间品质、现代技术影响延伸。结合南沙的发展定位和现实条件，规划提出以人为核心，以生态、品质、智慧为核心理念，建设理想城市典范——RES-city（Recreational-Eco-Smart City）。南沙新区的空间同时按照生态和产业自上而下与"单元-社区-街区-城市"自下而上组织逻辑进行安排。</p> <p>主要创新点：南沙新区的规划设计，由其高端定位带来了巨大的政策驱动力和社会影响力，同时，地处珠江三角洲湾区和广州新中心的地域特点，在不同的城市空间尺度、不同的城市运行系统、不同的地域特色和功能要求等方面，为尝试新的规划理念和设计手法提供了广阔的舞台，本规划研究创新探索主要体现在 4 方面：（1）注重战略视野的广度和深度，从国家战略和政策、城市群理论、世界城市</p> | | | | | |

理论、区域协作和竞争、新城规划理论、城市中心体系等方面，基于全球和区域产业体系，提出南沙新区发展定位和城市功能。(2) ESRC 规划设计理念在城市运行系统中的落实和体现在：在不同空间尺度的基础上，研究城市运行系统中对 ESRC 城市理念的具体控制要求；分别在城市生态系统、城市交通系统、城市基础设施系统和城市管理系统 4 个方面进行了系统探讨；在传统城市认识的基础上，加入对 ESRC 规划设计理念的新要求，在系统组成要素和系统运行方式两方面进行梳理。

(3) 注重规划过程本身、倡导多层次沟通交流。(4) 探索多专业团队合作模式。

此项目获得 2012 年北京市优秀工程规划勘察设计奖二等奖、2013 年度全国优秀城乡规划设计奖（城市规划类）二等奖。

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
|---|----------------------------|------|--------|---------------|--------|
| 2 | 中国城市地区人群 VOC 呼吸暴露与相关健康风险分析 | 研究报告 | 清华大学 | 张寅平 | 2014 |
| <p>通过广泛调研中国城市地区的 VOC 实测研究，结合中国城市地区各微环境中典型的 VOC 浓度，并利用蒙特卡洛模拟方法定量分析了中国城市地区人群 VOC 呼吸暴露量及相关健康风险。发现癌症风险最大的前十种 VOCs 分别为：甲醛、1,4-二氯苯、苯、1,3-丁二烯、乙醛、四氯化碳、乙苯、氯仿、三氯乙烯和苯乙烯，除甲醛、苯外，其余 8 种污染物均未列入我国现行国标《室内空气质量标准》(GB/T 18883)，超过 70% 的呼吸暴露癌症风险源自家庭室内的暴露。</p> | | | | | |

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
|----|--|------------------------|-----------------------|---------------|--------|
| 3 | Solar Collector and PCM Thermal Façade for Low Carbon Buildings, | MARIE CURIE Fellowship | Nottingham University | 王馨 (Co-PI) | 2014 |

低碳建筑是欧盟及英国建筑节能建筑的研究热点。实验室王馨联合英国诺丁汉大学的 Riffat 教授成功申请欧盟玛丽居里奖学金，研究用于低碳建筑的结合太阳能集热与相变蓄能围护结构的低碳建筑，获得国内外同行引用。

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
|----|---|------|--------|---------------|--------|
| 4 | 国 31 个重要城市 PM2.5 与 PM10 浓度时空变化以及与气态污染物的关系 | 论文 | 清华大学 | 赵彬 | 2014 |

研究了中国大城市中 PM2.5 季节变化规律及与气态污染物关系。我国从 2012 年底才在全国范围内展开 PM2.5 浓度的监测，对全国范围 PM2.5 浓度变化状况的研究还比较少。我们收集了全国 31 个重点城市 286 个监测点从 2013 年 3 月 22 日—2014 年 3 月 31 日的时均监测数据。在监测站数据基础上，得到了全国重要省会城市的 PM2.5 的季节变化规律，发现北方供热季节，煤炭燃烧会明显增加 PM2.5 浓度。研究还利用相关性分析研究了 PM2.5 与 SO₂, NO₂, CO 和 O₃ 关系，发现 PM2.5 与 SO₂, NO₂ 有较强的相关性，且不同城市之间存在较大差异。

相关成果发表于《Particuology》(影响因子 2.785)。SCI 被引频次: 45，本文是该期刊 5 年内引用次数最高的 3 篇论文之一，获得了 MIC-PARTICUOLOGY Excellent Article Awards。

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
|----|----------------|------|--------|---------------|-----------|
| 5 | 室外非均匀微气候定量模拟方法 | 论文 | 清华大学 | 朱颖心、林波荣 | 2013-2014 |

国际该领域存在将室外环境参数（如 I, T, V, H 等）视为均匀参数进行设计容易导致高能耗以及无法准确预测建筑尺度长短波辐射和空气随机流动耦合下的室外环境特性，依靠实测等问题，本研究对 N-S 方程、温度、湿度方程的改进，并采用半透明/不透明物体辐射通用计算模型。经过连续 15 年对典型气候区 30 多个

建筑群长期测试，揭示了室外微气候动态变化规律和关键影响参数；构建了室外空气流动、传热新模型，包括新的动量方程、 k ， ε 及温湿度方程（基于增添源项的方式）及提出了归一化表征方式和关键参数数值，并得到风洞实验验证；基于蒙特卡洛（射线追踪）-杰勃哈特（全交换面积守恒）方法，建立了适用于室内外透明（如植物冠层、水体）和不透明物体（建筑、道路等）共同存在的情况，并考虑了热平衡验和辐射表面的对称化计算，构建了长短波辐射通用计算模型；建立了室外非均匀微气候预测模型和模拟流程。

本部分成果有 11 篇 SCI 检索论文发表本领域国际顶级期刊上。

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
|----|--------------|------|-------------------|---------------|--------|
| 6 | 汤阴老城更新详细城市设计 | 设计文本 | 北京清华同衡规划设计研究院有限公司 | 徐刚（1）曹宇钧（5） | 2014 |

一、项目背景：资源、问题和需求

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二、整体架构：系统化织补

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1、文化经营

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利用汤阴历史上的文庙、县衙和岳飞庙东侧用地植入文化产业与旅游服务功能。三者通过文化街串联成为整体，以点式触媒的方式带动周边区域的有机更新。

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城墙遗址绿带作为历史边界的柔性标识，串联多个空间节点，构成历史老城的边缘景观。

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规划采取标准图集的参照方式，通过刚性控制和弹性选择相结合的方式指导大规模的自组织民宅建设行为。

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
|----|----------------|------|--------|---------------|--------|
| 7 | 夏热冬冷绿色农宅采暖热源研究 | 论文 | 清华大学 | 宋晔皓等 | 2014 |

以夏热冬冷绿色农宅研究为研究的主线里，在 2014 年 PLEA (Passive and Low Energy Architecture) 在印度阿尔哈德巴德举办的国际会议上，选读了针对乡野调研初步成果的 2 篇论文，尝试从整体设计思路里面，细分出采暖和气候适应两个板块。采暖板块力图指出可能的冬季热源，并且越村民日常生活相结合的改造模式。乡野调研则是严格按照不同建筑物理环境测试获得的结果，结合建筑的类型以及不同的区位，进行了细致的比较研究。这两篇论文是该方向研究的两个重点，即尝试提出解决夏热冬冷地区最为棘手的热源问题。同时通过大量建筑案例的第一手数据调研，包括建筑自身的测绘，完成项目研究进展的基础工作。

成果: Thermographic Study on Thermal Performance of Rural Houses in Southwest China; Design Strategies on Heat Recovery of Cooking Stove in Rural Houses of China (plea)

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
|----|---------------|------|-------------------|-----------------------------|--------|
| 8 | 天安门城楼景观照明提升工程 | 项目获奖 | 北京清华同衡规划设计研究院有限公司 | 荣浩磊、李丽、胡熠、兰靓、张玺璐、张贤德、赵俊波、刘斌 | 2014 |

照明设计创新点：

文物保护：取消建筑物难于维修部位灯具，改为远处投光方式，降低能耗的同时，避免了对文物造成破坏。改善色彩：用对红色、金色还原度更好的，特殊波段高显色性 LED 芯片光源，还原红墙和金色纹饰。消除眩光：利用光的反射原理，原创性的设计反射式灯具，使人眼不会直视光源，灯具表面亮度降至原来万分之一。环境保护：精确制定各部位亮度分布，建立舒适的视觉层次。使用精确配光的高品质灯具，减少溢散光，控制光污染。总能耗降低 70%灯具隐蔽：巧妙利用现场条件隐蔽灯具，对白天景观无影响。

本次提升采用创新技术，有效改善城楼光环境，提高了被照面亮度，同时消除了原有眩光。使用特殊光色搭配设计的灯具，较好的还原了墙面的中国红色彩，使城楼夜间形象更饱满、色彩更真实。选择技术成熟、高品质灯具，自竣工验收以来稳定运行。采用 LED 等节能光源，改造后景观照明耗电量仅为原来的 30%。

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|----|----------------|------|--------|---------------|--------|
| 9 | 北京动物园水禽馆整体设计方法 | 设计作品 | 清华大学 | 宋晔皓等 | 2014 |

以整体设计方法为主线的设计实践研究中，2014 年依照整体设计方法完成的实践作品北京动物园水禽馆项目获得 2014 “WA 中国建筑佳作奖”。这是一种对于将技术整合在建筑中，以建筑为主导，以研究性设计为思路的绿色建筑实践的成功突破，即以整体设计方法为指导，摆脱了建筑设计和绿色设计脱节的状况，并通过高品质设计获得了建筑圈里的学术认可。通过建筑学语境下可持续设计究竟为何的深入探讨，严格按照基本科学原理的指导，同时在同步介入的工程们的

协助下，完成了基于建筑设计的各个技术系统的整合和补完。该项目在后来还进入了亚洲建筑师协会奖的评奖短名单。

成果：建筑学语境下的可持续设计，解读北京动物园水禽馆，荣获 2014 年“WA 中国建筑佳作奖”

| 序号 | 成果名称 | 成果形式 | 第一完成单位 | 实验室参加人员姓名(排名) | 成果产生年度 |
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2. 承担省部级以上项目（课题）一览表

2014年，生态规划与绿色建筑教育部重点实验室承担在研科研项目（课题）共计76项，其中国家级21项，总经费3107.27万元。具体承担科研项目情况如下：

| 来源 | 项目名称 | 总项数 | 总经费 |
|-----|----------|-----|---------|
| 科技部 | 合计 | 9 | 2316.27 |
| | 国家科技重大专项 | 1 | 80 |
| | 973计划课题 | 2 | 415.3 |
| | 863计划项目 | 1 | 80 |
| | 重点研发计划 | 5 | 1740.97 |
| 来源 | 项目名称 | 总项数 | 总经费 |
| 基金委 | 合计 | 9 | 499 |
| | 创新群体 | | |
| | 杰青 | | |
| | 面上项目 | 2 | 80 |
| | 重点项目 | 4 | 219 |
| | 国际合作 | 1 | |
| | 优秀青年基金 | 2 | 200 |
| 来源 | 项目名称 | 总项数 | 总经费 |
| 教育部 | 合计 | 2 | 252 |

| | | | |
|------|--------|----|---------|
| | 青年千人 | | |
| | 自主科研计划 | | |
| 国际合作 | 合计 | 8 | 362.35 |
| 企业合作 | 合计 | 43 | 3734.23 |

(1) 实验室承担省部级以上项目详表

| 序号 | 项目/课题名称 | 编号 | 负责人 | 开始时间 | 结束时间 | 经费 (万元) | 类别 |
|----|---------------------------|--------------|---------|----------|------------|------------|-------------|
| 1 | 城市规划设计理论 | 51222813 | 田莉 | 2013/1/1 | 2015/12/1 | 100 | 优秀青年基金 |
| 2 | 基于城乡人口变化的中小学布局优化模型及政策路径研究 | 14BGL149 | 林文棋 | 2014/1/1 | 2017/12/31 | 20 | 国家社会科学基金项目 |
| 3 | 县、镇（乡）及村域规划编制关键技术研究及示范 | 2014BAJ04B01 | 顾朝林、林文棋 | 2014/1/1 | 2017/12/31 | 687 | 国家科技支撑计划课题 |
| 4 | 中俄城市空间发展模拟研究 | 5131120081 | 党安荣 | 2013 | 2014 | | 国际合作项目 |
| 5 | 无定河流域典型村落文化景观演化机制研究 | 51378277 | 党安荣 | 2014 | 2017 | | 面上项目 |
| 6 | 青年拔尖人才计划 | 10000000012 | 刘晓华 | 2013.01 | 2016.12 | 240 | 青年拔尖人才计划 |
| 7 | 建筑节能技术适宜性研究 | 20131309059 | 江亿 | 2013.7 | 2015.6 | 40 | 国家自然科学基金 |
| 8 | 建筑节能技术适宜性研究 | 20131669041 | 江亿 | 2013.7 | 2015.6 | 40 | 中国工程院 |
| 9 | 高原气候适应性节能建筑关键技术研究及示范 | 2013BAJ03B04 | 王馨 | 2013.1 | 2015.12 | 12 | 国家科技攻关 |
| 10 | 北京农村地区燃煤情况调研及燃 | 20131098932 | 杨旭东 | 2013.5 | 2015.6 | 102.97 | 国家发改委、科技部项目 |

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|----|-------------------------------|--------------|-----|----------|-----------|------------|----------------|
| | 煤减量化技术方案示范研究 | | | | | | |
| 11 | 农村节能型住宅建设及新型采暖系统开发与示范 | 20131090183 | 杨旭东 | 2013.1 | 2014.12 | 35 | 国家发改委、科技部项目 |
| 12 | 建筑天然气分布式供能系统相变蓄能调控机理与耦合关联机制研究 | 20131351411 | 王馨 | 2014.01 | 2017.12 | 80 | 863项目、国家自然科学基金 |
| 13 | 人体呼吸产生可挥发性有机物研究 | 20131351378 | 杨旭东 | 2014.1 | 2017.12 | 80 | 国家自然科学基金 |
| 14 | 基于太阳能长周期蓄热的区域性建筑集中供暖系统集成与示范 | 20131859455 | 杨旭东 | 2014.1 | 2016.12 | 904 | 国家科技支撑计划 |
| 15 | 北京市儿童哮喘等过敏疾病与室内空气污染暴露关联性研究 | 20131018987 | 张寅平 | 2014.01 | 2015.12 | 12 | 教育部科技项目 |
| 16 | 绿色机场规划设计、建造及评价关键技术研究 | 2014BAJ04B03 | 朱颖心 | 2014.1 | 2017.12 | 346 | 973项目 |
| 17 | 座舱最佳空气质量和热舒适性研究 | 20121978100 | 朱颖心 | 2013.12 | 2015.12 | 69.3 | 973项目 |
| 18 | 建筑热环境 | | 林波荣 | 2013 | 2015 | 100 | 优秀青年基金 |
| 19 | 作为城市历史景观的历史街区保护与可持续发展研究 | 51378280 | 张杰 | 2014.1 | 2017.12 | 80 | 国家科技重大专项 |
| 20 | 基于建筑物理性能的夏热冬冷地 | 51278262 | 宋晔皓 | 2013/1/1 | 2016/12/1 | 79 | 国家自然科学基金委员会 |

| 序号 | 项目/课题名称 | 编号 | 负责人 | 开始时间 | 结束时间 | 经费 (万元) | 类别 |
|----|---------------------|----------|-----|----------|----------------|------------|------|
| | 区绿色农宅建筑设计策略研究 | | | | | | |
| 21 | 基于结构分析的 建筑形态生成研究 | 51278263 | 黄蔚欣 | 2013/1/1 | 2016/1 2/31 | 80 | 面上项目 |

(2) 承担其他项目（课题）一览表

| 序号 | 项目/课题名称 | 编号 | 负责人 | 开始时间 | 结束时间 | 经费 (万元) | 类别 |
|----|--------------------------------------|-------------------|-----|----------------|----------------|------------|-----------------------|
| 1 | 美丽乡村建设中的 规划问题研究 | 20142001 025 | 尹稚 | 2014/9/ 1 | 2014/1 2/31 | 15 | 企事业单位项目 |
| 2 | 《贵阳市城市总体规划（2011-2020年）》 （2013年修改） | A012- 13480-01 | 王晓东 | 2013.1 2.23 | 2017.1 2 | 549.23 | 企事业单位项目 |
| 3 | 吉林市城市空间 发展战略规划 | A012- 13275-01 | 吴邦奎 | 2013.7. 15 | 进行中 | 200 | 企事业单位项目 |
| 4 | 宿迁市城市发展战略 规划 | A012- 14418-01 | 刘晋媛 | 2014.9. 30 | 2016.9 | 143 | 企事业单位项目 |
| 5 | 轨道交通发展对 城市商业中心的 重塑 | | 龙瀛 | 2014/1 2/1 | 2015/1 2/1 | 6 | 北大-林肯 中心研究 基金项目 |
| 6 | 北京市城乡规划 评估方法研究 | 20142000 942 | 党安荣 | 2014 | 2016 | | 企事业单位项目 |
| 7 | 昌平区低碳生态 体系规划实施机 制研究 | | 邹涛 | 2013 | 2014 | 55 | 企事业单位项目 |
| 8 | 天津静海新区团 泊新城景观概念 性规划设计 | | 卢碧涵 | 2013 | 2014 | 20 | 企事业单位项目 |
| 9 | 生态福州总体规 划 | | 汪淳 | 2013 | 2015 | 320 | 企事业单位项目 |

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|----|-----------------------------|-----------------|-----|------------------|------------------|------------|---------|
| 10 | 中关村贵阳科技园空间布局规划 | | 汪淳 | 2013 | 2015 | 215 | 企事业单位项目 |
| 11 | 贵安新区生态文明建设规划 | | 汪自书 | 2015 | 2017 | 332.8 | 企事业单位项目 |
| 12 | 青海省海东市湟水河流域生态规划 | | 胡洁 | 2014 | 2018 | 390 | 企事业单位项目 |
| 13 | 昆明晋宁东大河湿地公园 | | 许申来 | 2014 | 2018 | 91.2 | 企事业单位项目 |
| 14 | 中粮成都大悦城机电(能源)系统节能设计优化咨询服务合同 | 20142000 129 | 魏庆芄 | 2013 年12 月 | 2014 年12 月 | 95 | 企事业单位项目 |
| 15 | 华远意通供热能耗指标及节能措施分析研究 | 20142000 254 | 夏建军 | 2014 年1月 | 2015 年4月 | 10 | 企事业单位项目 |
| 16 | 工业余热新型渣水换热设备研发及供热系统设计 | 20142000 928 | 夏建军 | 2014 年8月 | 2015 年8月 | 15 | 企事业单位项目 |
| 17 | 单元组合型城市空间发展规划 | 20132000 298 | 宋晔皓 | 2013 年1月 | 2014 年1月 | 25 | 企事业单位项目 |
| 18 | 鹤淇一体化城区水系景观规划 | 20132000 299 | 宋晔皓 | 2013 年1月 | 2014 年1月 | 27 | 企事业单位项目 |
| 19 | 鸿坤健康地产技术整合策略与应用合作研究 | 20142001 017 | 宋晔皓 | 2014 年5月 | 2016 年5月 | 76 | 企事业单位项目 |
| 20 | 吉林华桥外国语学院国际交流中心项目 | 20142000 618 | 刘念雄 | 2014 年12 月 | 2014 年12 月 | 36.7 | 企事业单位项目 |
| 21 | 临沂第一中学规划与建筑概念设计 | 20142001 089 | 韩孟臻 | 2014 年9月 | 2014 年10 月 | 10 | 企事业单位项目 |
| 22 | 北京市建筑设计研究院有限公司知识管理基本构架研究 | 20142000 22 | 姜涌 | 2014 年3月 | 2014 年10 月 | 18.8 | 企事业单位项目 |

| 序号 | 项目/课题名称 | 编号 | 负责人 | 开始时间 | 结束时间 | 经费 (万元) | 类别 |
|----|-----------------------------|-------------|-----|---------|---------|------------|---------|
| 23 | 人员呼吸对飞机机舱内挥发性有机物污染贡献率的模拟分析 | 20132000717 | 杨旭东 | 2013.7 | 2014.6 | 25 | 企事业单位项目 |
| 24 | 玉树绿色生态建筑设计及采暖方案优化 | 20132001159 | 杨旭东 | 2013.8 | 2015.7 | 0 | 企事业单位项目 |
| 25 | 30L 小型环境舱洁净气体配气管路及不锈钢配件项目 | 20132000887 | 张寅平 | 2013.7 | 2014.9 | 5 | 企事业单位项目 |
| 26 | 空气净化器性能评估 | 20132000665 | 张寅平 | 2013.5 | 2014.5 | 17.64 | 企事业单位项目 |
| 27 | 气宇 AT 组合式空调机组选型及热管换热器选型软件开发 | 20132000904 | 张寅平 | 2013.7 | 2014.1 | 7.5 | 企事业单位项目 |
| 28 | 新型绝热保温板的工程化开发 | 20132000995 | 张寅平 | 2013.7 | 2015.3 | 40 | 企事业单位项目 |
| 29 | 面向局部需求的建筑内高大空间热湿环境营造方法研究 | 20141450033 | 李先庭 | 2014.1 | 2015.12 | 15 | 校内基金项目 |
| 30 | 地铁车站空调负荷模拟计算及运营管理节能研究 | 20142000200 | 李晓锋 | 2013.12 | 2014.6 | 85 | 企事业单位项目 |
| 31 | 广州职业技术学院迁建项目绿色建筑咨询服务 | 20142001559 | 李晓锋 | 2014.8 | 2018.8 | 240 | 企事业单位项目 |
| 32 | 烟雾发生器及甲醛气体发生器制作 | 20142001398 | 莫金汉 | 2014.11 | 2015.12 | 3.4 | 企事业单位项目 |
| 33 | 社区建筑群冷热负荷模拟分析模型 | | 燕达 | 2014.01 | 2015.12 | 5 | 省市自治区项目 |

| 序号 | 项目/课题名称 | 编号 | 负责人 | 开始时间 | 结束时间 | 经费 (万元) | 类别 |
|----|----------------------------------|-------------|-----|---------|---------|------------|---------|
| 34 | 社区建筑群冷热负荷模拟分析方法研究 | 8142022 | 燕达 | 2014.01 | 2016.06 | 18 | 省市自治区项目 |
| 35 | “太阳能热水+空气源热泵”联合供热系统示范工程测试与评价 | 20142000697 | 杨旭东 | 2014.1 | 2016.3 | 15 | 企事业单位项目 |
| 36 | 太阳能采暖和室内空气净化技术方案指导及评估 | 20142000955 | 杨旭东 | 2014.8 | 2019.8 | 150 | 企事业单位项目 |
| 37 | 降低室外颗粒物及复合污染对室内影响的控制技术研究 | 20131459139 | 张寅平 | 2014.01 | 2015.12 | 40 | 企事业单位项目 |
| 38 | 室内空气细颗粒物污染和健康风险评价及控制对策研究 | 20141440211 | 张寅平 | 2014.01 | 2016.12 | 135 | 企事业单位项目 |
| 39 | 海尔空气净化设备净化性能评估 | 20142000574 | 张寅平 | 2014.05 | 2015.05 | 50 | 企事业单位项目 |
| 40 | 建筑表面阻隔层传质特性参数测定用实验系统专利实施许可合同 | 20142000893 | 张寅平 | 2014.01 | 2019.07 | 50 | 企事业单位项目 |
| 41 | 一种用于检测室内建材有机挥发物散发特性的双舱系统专利实施许可合同 | 20142000894 | 张寅平 | 2014.01 | 2019.07 | 50 | 企事业单位项目 |
| 42 | 室内空气污染物样品分析 | 20142001399 | 张寅平 | 2014.1 | 2014.12 | 1.16 | 企事业单位项目 |
| 43 | 厦门蒙发利净化器试验环境舱制作 | 20142001496 | 张寅平 | 2014.11 | 2014.12 | 24 | 企事业单位项目 |
| 44 | 飞利浦空气实验室建设技术合作 | 20143000046 | 张寅平 | 2014.02 | 2014.12 | 67.8 | 企事业单位项目 |

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|----|--|-----------------|-----|-------------|-------------|------------|---------|
| 45 | 合作研究开发合同 | 20143000 098 | 张寅平 | 2013.1 | 2014.0 9 | 28 | 企事业单位项目 |
| 46 | 迅达电梯梯步车间热环境模拟及优化分析 | 20143000 250 | 张寅平 | 2014.0 8 | 2014.1 2 | 5 | 企事业单位项目 |
| 47 | 自然风技术研发及在家用空调中的应用 | 20142001 189 | 朱颖心 | 2014.9 | 2016.3 | 50 | 企事业单位项目 |
| 48 | 青藏高原地区农户生活用能干预措施对室内空气质量、人员健康及环境综合改善效果研究 | 20143000 040 | 杨旭东 | 2013.0 9 | 2016.1 2 | 102 | 国际合作项目 |
| 49 | 飞机机舱中由于材料及飞机运行造成的挥发性有机物(VOC)散发数据库(2014) | 20153000 005 | 杨旭东 | 2014.0 1 | 2015.0 2 | 65 | 国际合作项目 |
| 50 | Definition and Simulation of Occupant Behavior in Buildings | 10000000 020 | 燕达 | 2013.1 1 | 2017.0 6 | | 国际合作项目 |
| 51 | Effects of Lubricant Oil on Energy Performance of Chiller | 20133000 248 | 王宝龙 | 2013.0 7 | 2015.1 2 | 63.6 | 国际合作项目 |
| 52 | 中美超低能耗建筑技术合作研究与示范 | 10000000 005 | 梁俊强 | 2014.0 4 | 2016.0 3 | 20 | 国际合作项目 |
| 53 | Research on Air Conditioning Facility Design Method of VRF Systems | | 燕达 | 2013.1 | 2014.0 9 | 24 | 国际合作项目 |

| 序号 | 项目/课题名称 | 编号 | 负责人 | 开始时间 | 结束时间 | 经费 (万元) | 类别 |
|----|---------------------------------------|-------------|-----|--------|---------|------------|--------|
| 54 | 飞机机舱中挥发性有机物(VOC)散发数据库(波音公司) | 20133000073 | 杨旭东 | 2014.1 | 2014.12 | 65 | 国际合作项目 |
| 55 | 针对支撑降低全球建筑领域温室气体排放研究的中国建筑能源分析(伯克利实验室) | 20133000112 | 杨旭东 | 2013.3 | 2014.9 | 22.75 | 国际合作项目 |

三、发表论文、专著专利情况

实验室在 2014 年度共发表论文 48 篇，其中 SCI 收录期刊论文 8 篇；出版专著 8 项。2014 年度授权专利 7 项，申请专利 14 项，新软件 4 项。

1. 发表论文一览表

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期(或章节)、页 | IF | 第一完成单位 | EI 或 SCI 索引 |
|----|--|---------------------------|---|------------------------------|----|--------|-------------|
| 1 | Dignitary interests groups are the biggest obstacles to solve China's environmental problems | Lin, Wen Qi; Ma, Ming Fei | Resources and Sustainable Development III | v 962-965, p 2023-2026, 2014 | | 是 | EI |
| 2 | Cooling extent of green parks: A case study in Beijing | Lin, Wen Qi | Advanced Materials Research | v 962-965, p 2005-2017, 2014 | | 是 | EI |
| 3 | Mass Incidents Push Government to Curb | W. Q. Lin, X. Q. | Advanced Materials | Vols. 962-965, pp. | | 是 | EI |

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期(或章节)、页 | IF | 第一完成单位 | EI或SCI索引 |
|----|---|--------------------------------|---------------------------|---|-------|--------|----------|
| | Environmental Pollution in China's Urbanization | Chang, M. F. Ma | Research | 2429-2435,2014 | | | |
| 4 | 与自然共同生长的城市绿色空间——基于生境网络视角的城市绿色空间规划思路探讨 | 吕晓芳、 胡洁 | 第九届城市发展与规划大会论文集 | 2014年 | | 是 | |
| 5 | 河道淹没区中的景观空间——辽阳衍秀公园景观设计 | 胡洁 | 风景园林师 | 2014第13期 | | 是 | |
| 6 | 唐山南湖中央公园规划设计 | 胡洁 | 生态城市与绿色建筑 | 2014冬季刊 | | 是 | |
| 7 | 超高层建筑环境性能模拟优化研究 | 刘加根; 赵洋; 林波荣 | 建设科技 | 2014.11 | | 否 | |
| 8 | 基于实际建筑环境的人体热适应研究(2)——集中供暖与分户独立供暖住宅对比 | 曹彬; 李敏; 欧阳沁; 朱颖心 | 暖通空调 | 2014.1 | | 是 | |
| 9 | 基于实际建筑环境的人体热适应研究(1)——夏季空调与非空调公共建筑对比 | 曹彬; 黄莉; 欧阳沁; 朱颖心 | 暖通空调 | 2014.8 | | 是 | |
| 10 | Energy-efficient building envelopes with phase-change materials: new understanding and related research | Cheng R, Wang X, Zhang Y | Heat Transfer Engineering | 卷: 35 期: 11-12 特刊: SI 页: 970-984 出 | 1.104 | 否 | SCI |

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期(或章节)、页 | IF | 第一完成单位 | EI或SCI索引 |
|----|---|---------------------------------|--|---|-------|--------|----------|
| | | | | 版年: JUL 24 2014 | | | |
| 11 | Numerical study of the influences of different patterns of the building and green space on micro-scale outdoor thermal comfort and indoor natural ventilation | Hong B, Lin B | Building Simulation | 卷: 7 期: 5 页: 525- 536 出 版年: OCT 2014 | 1.318 | 否 | SCI |
| 12 | Thermal comfort in an open space of an office building: A field study in subtropical region | Cao B, Li M, Liu G, et al | proceedings of the 13th international conference on indoor air quality and climate, at Hong Kong, topic A | 2014 | | 否 | EI |
| 13 | Comparison of Contribution of Outdoor Particle Between Indoor Sources to Indoor PM2.5 Concentration and Associated Exposure: A Preliminary Modeling Study | Ji W J, Zhao B | ISIAQ | p 297- 304, 2014 | | 否 | EI |

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期 (或章节)、页 | IF | 第一完成单位 | EI 或 SCI 索引 |
|----|---|--|---------------------------|---|-------|--------|----------------------|
| 14 | Numerical study of the effects of trees on outdoor particle concentration distributions | Ji W, Zhao B | Building Simulation | 卷: 7 期: 4 页: 417-427 出 版年: AUG 2014 | 1.318 | 否 | SCI |
| 15 | Analysis on energy saving potential of fcus with cooling water in the upper zone in large-space buildings with stratified air-conditioning system | Liang C, Li X, Shao X, et al | ISIAQ | 2014, p 347-353 | | 否 | EI |
| 16 | Equivalent contaminant source: a new index to evaluate the local ventilation performance | LIANG C, JIANG X, SHAO X, et al | ISIAQ | 2014 | | 否 | EI |
| 17 | Risk assessment of population inhalation exposure to volatile organic compounds and carbonyls in urban China | Du Z, Mo J, Zhang Y | Environment international | 2014, 卷: 73 页: 33-45 | 6.86 | 否 | SCI |
| 18 | The Energy-related Impacts of Social Factors of Rural Houses in Southwest China | Yehao Song, Julian (Jialiang) Wang、 | Energy Procedia | 2014/7/5 | — | 否 | |

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期(或章节)、页 | IF | 第一完成单位 | EI或SCI索引 |
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| | | Shimeng Hao、Yilin Song | | | | | |
| 19 | Design Strategies on Heat Recovery of Cooking Stove in Rural Houses of China | Shimeng Hao、 Yehao Song、 Gui Zhang、 Zhenghao Lin、 Ning Zhu、 Jialiang Wang | PLEA | 2014/7/6 | — | 否 | |
| 20 | Thermographic Study on Thermal Performance of Rural Houses in Southwest China | Yehao Song、 Shimeng Hao、 Jialiang Wang、 Ning Zhu、 Junjie Li | PLEA | 2014/7/6 | — | 否 | |
| 21 | Field Study on Indoor Thermal and Luminous Environment in Winter of | Shimeng Hao、 Yehao | Journal of Harbin Institute of Technology | 2014 NO.4 | — | 否 | EI |

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期(或章节)、页 | IF | 第一完成单位 | EI或SCI索引 |
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| | Vernacular Houses in Northern Hebei Province of China(EI 检索) | Song、 Junjie Li、 Ning Zhu | | | | | |
| 22 | Fieldwork Test Research of the impact on Building Physical Environment on Six Types of Atrium Space in Cold Climates (EI 检索) | Yehao Song, Junjie Li, Ning Zhu, Jialiang Wang, Zhenghao Lin. | Journal of Harbin Institute of Technology | 2014 NO.4 | — | 否 | EI |
| 23 | WRF Environment Assessment in Guangzhou City with an Extracted Land-use Map from the Remote Sensing Data in 2000 as an example (EI 检索) | Yuan Li、 Yehao Song、 Akashi Mochida、 Tsubasa Okaze | Journal of Harbin Institute of Technology | 2014 NO.5 | — | 否 | EI |
| 24 | Research on Two Types of Buffer Zone Impact on Surrounding Office Space Environment in Winter in Cold Climate Zone—a Fieldwork in Architectural Design Institute Building of | Yehao Song, Junjie Li, Ning Zhu, Jialiang Wang, Shimeng Hao | Journal of Harbin Institute of Technology | 2014 NO.5 | | 否 | EI |

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期(或章节)、页 | IF | 第一完成单位 | EI 或 SCI 索引 |
|----|---|--|-------------------------|-------------|------|--------|-------------|
| | Tsinghua University, Beijing. (EI 检索) | | | | | | |
| 25 | 建筑学语境下的可持续设计 解读北京动物园水禽馆 | 宋晔皓、孙菁芬 | 时代建筑 | 2014 年 05 期 | 0.47 | 是 | |
| 26 | Optimization of Skin Oriented to Multi-system Integration in Design and Construction Phases by BIM Technologies | Yehao Song, Dongchen Han, Zhenghao Lin, Jingfen Sun, Xiaojuan Chen | Advanced Building Skins | 2014/7/8 | — | 否 | |
| 27 | An energy-efficient prefabricated double-skin façade oriented to multisystem integration | Yehao Song, Zhenghao Lin, Dongchen Han, Jingfen Sun, Xiaojuan | Advanced Building Skins | 2014/7/8 | — | 否 | |

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期(或章节)、页 | IF | 第一完成单位 | EI 或 SCI 索引 |
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| | | Chen | | | | | |
| 28 | A CLIMATE RESPONSIVE DOUBLE-SKIN FAÇADE PROTOTYPE FOR LIGHTWEIGHT PREFABRICATED BUILDINGS IN TWO CLIMATIC ZONES OF CHINA | Zhenghao LIN, Yehao SONG; Dongchen HAN, Jingfen SUN, Xiaojuan CHEN, Dan XIE, Yingnan CHU | SARCH 2018 | 2014/7/10 | — | 否 | |
| 29 | “模块美学”——光州集装箱艺术馆设计解析 | 王蔚; 欧雄全; 李眈 | 建筑技艺 | 2014/6/20 | | 否 | |
| 30 | 城市空间扩张与机动化水平增长之间的互动关系探析 | 丁川; 林姚宇; 王耀武 | 交通运输系统工程与信息 | 2014/6/15 | | 否 | |
| 31 | 长沙城区工业建筑保护与更新后的可持续探讨 | 王蔚; 邵磊; 黄磊; 高青 | 建筑学报 | 2014/4/20 | | 否 | |
| 32 | 绿色住宅的智能化控制技术——以 SDC2013 参赛作品为例 | 高青; 王蔚 | 第十届国际绿色建筑与建筑节能大会暨新技术与产品博 | 2014/3/28 | | 否 | |

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| | | | 览会论文集— —S02 绿色建筑 智能化与数字 技术 | | | | |
| 33 | 城市边缘区空间发展探讨——以北京市海淀区为例 | 姚月 | 地球信息科学学报 | 2014/3/15 | | 否 | |
| 34 | 国外集装箱住区的规划设计启示 | 王蔚; 邵磊; 欧雄全; 李眈 | 住宅产业 | 2014/1/20 | | 否 | |
| 35 | Towards net zero energy building: Collaboration-based sustainable design and practice of the Beijing waterfowl pavilion | Song Y, Sun J, Li J, et al | Energy Procedia | 2014 | | 否 | |
| 36 | Trivalent chromium solubility and its influence on quantification of hexavalent chromium in ambient particulate matter using EPA method 6800 | Huang L, Yu C H, Hopke P K, et al | Journal of the Air & Waste Management Association | 卷: 64 期: 12 页: 1439-1445 出版年: 2014 | 1.641 | 否 | SCI |
| 37 | Modeling the joint choice decisions on | Ding C, Xie B, | Discrete Dynamics in | 2014 | 0.668 | 否 | SCI |

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| | urban shopping destination and travel-to-shop mode: A comparative study of different structures | Wang Y, et al | Nature and Society | | | | |
| 38 | Joint analysis of urban shopping destination and travel mode choice accounting for potential spatial correlation between alternatives | Lin Y, Ding C, Wang Y, et al | Journal of Central South University | 2014 | 0.67 | 否 | SCI |
| 39 | Exploring the influence of built environment on tour-based commuter mode choice: a cross-classified multilevel modeling approach | Ding C, Lin Y, Liu C | Transportation Research Part D: Transport and Environment | 2014 | 2.856 | 否 | SCI |
| 40 | Mass Incidents Push Government to Curb Environmental Pollution in China's Urbanization | Lin W Q, Chang X Q, Ma M F | Advanced Materials Research | 2014 | | 是 | EI |
| 41 | 基于联络性规划方法的总体规划编制探索 ——以阜平县城乡总体规划为例 | 赵丽虹、王鹏、卢庆强 | 2014 年中国城市规划年会论文集 | 2014 | | 否 | |
| 42 | 引领资源型经济转型的 | 欧阳鹏、 | 2014 年中国城 | 2014 | | 否 | |

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| | 科技城规划策略研究——以山西科技创新城核心区为例 | 董晓莉、汪淳、冯雨 | 市规划年会论文集 | | | | |
| 43 | 对当前城市总体规划评估工作的思考与展望 | 欧阳鹏、陈珊珊、李世庆 | 理想空间 | 2014 | | | |
| 44 | 生态脆弱-文化资源富集地区城乡发展战略研究——以敦煌市城市总体规划为例 | 董晓莉、欧阳鹏、钟来天、赵博、闫庆雨、李凯 | 2014 年中国城市规划年会论文集 | 2014 | | 否 | |
| 45 | 建设绿洲型田园城市——敦煌城乡一体化规划策略 | 欧阳鹏、董晓莉、钟来天 | 2014 年中国城市规划年会论文集 | 2014 | | 否 | |
| 46 | 基于行动导向的城市风貌规划编制体系与编制方法探索——以眉山市中心城区总体风貌控制规划实践为例 | 王昆、谢宇、王健、田园 | 2014 年中国城市规划年会论文集 | 2014 | | 否 | |
| 47 | 基于 GIS 三维分析的山地城市空间形态管控引导——以四川眉山岷东新区为例 | 谢宇、陈蕾、王昆 | 第三届山地城镇可持续发展专家论坛论文集 | 2014 | | | |
| 48 | 呼和浩特市城乡互动的经验及对呼包鄂榆地区 | 李世庆、扈茗、崔 | 2014 年中国城市规划年会论 | 2014 | | 否 | |

| 序号 | 论文名称 | 所有作者 | 刊物、出版社名称 | 卷、期(或章节)、页 | IF | 第一完成单位 | EI 或 SCI 索引 |
|----|------|------|----------|------------|----|--------|-------------|
| | 的借鉴 | 音、张辉 | 文集 | | | | |

2. 专著一览表

| 序号 | 专著名称 | 出版年度 | 作者 | 说明 |
|----|--|------|-----------------------------|------|
| 1 | Land Values, Property Rights and Urban Development: Betterment and Compensation under the Land Use Rights of China | 2014 | 田莉 | 独立完成 |
| 2 | 《雨水共生-中荷滨水新城对比研究》 | 2014 | 周正楠、邹涛 | 独立完成 |
| 3 | 中国建筑节能年度发展研究报告 2014 | 2014 | 魏庆芑 | 独立完成 |
| 4 | 溶液除湿 | 2014 | 刘晓华, 李震, 张涛 | 独立完成 |
| 5 | Integrated Design for High Performance Buildings | 2014 | T Hong, D Yan, C Li, et al. | 独立完成 |
| 6 | Stochastic Modeling of Overtime Occupancy and Its Application in Building Energy Simulation and Calibration | 2014 | T Hong, D Yan, K Sun, S Guo | 独立完成 |
| 7 | 中国室内环境与健康研究进展报告 (2013-2014) | 2014 | 邓启红 (主编)、钱华、赵卓慧、莫金汉 (副主编) | 独立完成 |
| 8 | 中国建筑节能年度发展研究报告 2014 | 2014 | 江亿、燕达、 | 独立 |

| 序号 | 专著名称 | 出版年度 | 作者 | 说明 |
|----|------|------|------|----|
| | | | 夏建军等 | 完成 |

3. 发明专利一览表

(1) 申请专利列表

| 序号 | 专利名称 | 专利申请号 | 获准国别 | 完成人 | 类型 | 类别 | 申请年度 |
|----|-------------------------|--------------------|------|------------------------|------|------|------|
| 1 | 一种幕墙及门窗自动启闭装置 | 2014106352 57.4 | 中国 | 赵勇, 夏建军 | 发明专利 | 独立完成 | 2014 |
| 2 | 一种用于城市集中供热的铜厂低品位余热回收系统 | 2014201549 08.3 | 中国 | 夏建军, 方豪, 宿颖波, 于峰, 江亿 | 发明专利 | 独立完成 | 2014 |
| 3 | 一种单蒸发器型太阳能空气源复合热泵及其运行方法 | 2014104490 74.3 | 中国 | 李先庭, 冉思源, 吴伟, 石文星, 王宝龙 | 发明专利 | 独立完成 | 2014 |
| 4 | 一种单蒸发器型太阳能空气源复合热泵 | 2014205097 40.3 | 中国 | 李先庭, 冉思源, 吴伟, 石文星, 王宝龙 | 发明专利 | 独立完成 | 2014 |
| 5 | 一种可双向传热的微阵列热管气-液换热装置 | 2014101004 76.2 | 中国 | 李先庭, 石文星, 张朋磊, 王宝龙, 沈翀 | 发明专利 | 独立完成 | 2014 |
| 6 | 一种锅炉烟气深度热回收装置及方法 | 2014103743 97.0 | 中国 | 李先庭; 纪文杰; 吴伟; 王宝龙; 耿 | 发明专利 | 独立完成 | 2014 |

| 序号 | 专利名称 | 专利申请号 | 获准国别 | 完成人 | 类型 | 类别 | 申请年度 |
|----|------------------------------------|--------------------|------|----------------------------|------|------|------|
| | | | | 阳; 潘文彪; 石文星 | | | |
| 7 | 一种复合太阳能空气源热泵 | 2014102222 76.4 | 中国 | 李先庭;吴伟;王宝龙; 冉思源;张朋磊;石文星 | 发明专利 | 独立完成 | 2014 |
| 8 | 一种微阵列热管气-液换热装置 | 2014101004 90.2 | 中国 | 石文星, 张朋磊, 王宝龙, 沈翀, 李先庭 | 发明专利 | 独立完成 | 2014 |
| 9 | 一种溶液喷淋式无霜空气源热泵装置 | 2014102085 75.2 | 中国 | 石文星;李宁;宋鹏远; 李先庭;王宝龙 | 发明专利 | 独立完成 | 2014 |
| 10 | 一种带有风机的平板太阳能空气集热装置 | 2014205695 65.7 | 中国 | 杨旭东, 熊帝战, 王鹏 苏 | 实用新型 | 独立完成 | 2014 |
| 11 | 一种平板型空气-水两用太阳能集热器 | 2014201651 30.6 | 中国 | 杨旭东, 熊帝战, 续宇 鹏, 邓杰 | 实用新型 | 独立完成 | 2014 |
| 12 | 一种基于群体满意度定制和节能的建筑室内环境监测、反馈与控制系统及方法 | CN1043172 68B | 中国 | 林波荣; 张春晖 | 发明专利 | 独立完成 | 2014 |
| 13 | 一种通风吸湿保温墙体构造 | CN1038353 93B | 中国 | 林波荣; 张春晖 | 发明专利 | 独立完成 | 2014 |

| 序号 | 专利名称 | 专利申请号 | 获准国别 | 完成人 | 类型 | 类别 | 申请年度 |
|----|--------------------------|-------------------|------|-------------|------|------|------|
| 14 | 一种基于移动互联网的建筑用能计量与节能系统及方法 | 2014105922 320 | 中国 | 林波荣; 张春晖 | 发明专利 | 独立完成 | 2014 |

(2) 获得专利列表

| 序号 | 专利名称 | 专利授权号 | 获准国别 | 完成人 | 类型 | 类别 | 获准年度 |
|----|---------------------|--------------------|------|------------------------|------|------|------|
| 1 | 一种能够降低一次网回水温度的供热系统 | 20142011 4234.4 | 中国 | 夏建军 | 实用新型 | 独立完成 | 2014 |
| 2 | 一种能够降低一次网回水温度的供热系统 | 20132011 4234.4 | 中国 | 夏建军, 方豪, 宿颖波, 于峰, 江亿 | 实用新型 | 独立完成 | 2014 |
| 3 | 一种燃烧生物质颗粒燃料的柴灶 | 20132034 3000.2 | 中国 | 单明、吴金山、李佳蓉、赵春生、李定凯、杨旭东 | 实用新型 | 独立完成 | 2014 |
| 4 | 一种具有PM2.5过滤功能的自然通风器 | 20142002 7986.7 | 中国 | 杨旭东, 梁卫辉, 杨琄 | 实用新型 | 独立完成 | 2014 |
| 5 | 一种兼顾局部和空间供暖的炕采暖末端 | 20142030 5364.6 | 中国 | 杨旭东, 王鹏苏, 单明, 熊帝战 | 实用新型 | 独立完成 | 2014 |
| 6 | 一种自动调节风向的水平轴 | 20132063 9195.5 | 中国 | 杨旭东, 续宇鹏, 王鹏 | 实用新型 | 独立完成 | 2014 |

| 序号 | 专利名称 | 专利授权号 | 获准国别 | 完成人 | 类型 | 类别 | 获准年度 |
|----|----------------|--------------|------|----------|------|------|------|
| | 搅拌式风力制热装置 | | | 苏, 单明 | | | |
| 7 | 一种新型通风吸湿保温墙体构造 | CN203977624U | 中国 | 林波荣; 张春晖 | 实用新型 | 独立完成 | 2014 |

(3) 新软件一览表

| 序号 | 软件名称 | 登记号 | 获准国别 | 完成人 | 类型 | 类别 | 获准年度 |
|----|-------------------|--------------|------|-------------------|---------|------|-------|
| 1 | 昆明市雨污调储系统数据采集传输系统 | 2014SR004633 | 中国 | 北京清华同衡规划设计研究院有限公司 | 软件著作权登记 | 独立完成 | 2014年 |
| 2 | 排水管网巡查养护管理软件系统 | 2014SR085315 | 中国 | 北京清华同衡规划设计研究院有限公司 | 软件著作权登记 | 独立完成 | 2014年 |
| 3 | 管网与污水厂联合运行调度系统 | 2014SR085325 | 中国 | 北京清华同衡规划设计研究院有限公司 | 软件著作权登记 | 独立完成 | 2014年 |
| 4 | 城市面源污染负荷消减策略评估软件 | 2014SR085431 | 中国 | 北京清华同衡规划设计研究院有限公司 | 软件著作权登记 | 独立完成 | 2014年 |

四、获得奖励情况

2014 年度，实验室共计获得 25 个奖项，其中设计奖 12 项，论文奖 2 项，科研奖 8 项，个人奖 3 项。

| 序号 | 项目名称 | 奖项名称 | 奖励类型 | 完成人 |
|----|------------------------------|------------------------------|------|---------|
| 1 | 《玉树新寨嘉那嘛呢石经城控制性详细规划》 | 全国优秀城乡规划设计奖（城市规划类）二等奖 | 设计奖 | 清华同衡 |
| 2 | 《南宁市城市总体规划（2011-2020）》 | 2013 年度全国优秀城乡规划设计奖（城市规划类）三等奖 | 设计奖 | 清华同衡 |
| 3 | 《内蒙古自治区呼包鄂城市群规划（2010—2020）》 | 2013 年度全国优秀城乡规划设计奖（城市规划类）三等奖 | 设计奖 | 清华同衡 |
| 4 | 《昌平区低碳生态体系规划实施机制研究》 | 2013 年度北京市规划系统优秀调研成果二等奖 | 设计奖 | 清华同衡 |
| 5 | 《天津静海新区团泊新城景观概念性规划设计》 | 国际风景园林师联合会亚太地区风景园林规划类荣誉奖 | 设计奖 | 清华同衡 |
| 6 | 《葫芦岛龙湾商务区滨海木栈道设计》 | 英国景观行业协会国家景观奖国际项目奖金奖 | 设计奖 | 清华同衡 |
| 7 | 《重庆印象武隆项目景观设计》 | 国际风景园林师联合会亚太地区风景园林设计类国际奖 | 设计奖 | 清华同衡 |
| 8 | 《阜新玉龙新城玉龙湖公园设计》 | BALI 银奖 | 设计奖 | 清华同衡 |
| 9 | 正定历史文化名城保护与风貌格局展示控制规划 | 2013 年度全国优秀城乡规划设计奖（城市规划类）一等奖 | 设计奖 | 张杰、霍晓卫等 |
| 10 | 凤凰区域性防御体系申报世界文化遗产预备名录研究及保护规划 | 2013 年度全国优秀城乡规划设计奖（城市规划类）一等奖 | 设计奖 | 张杰、霍晓卫等 |
| 11 | 广州南沙新区总体概念规划国际咨询 | 2013 年度全国优秀城乡规划设计（城市规划类）二等奖 | 设计奖 | 恽爽等 |

| 序号 | 项目名称 | 奖项名称 | 奖励类型 | 完成人 |
|----|--|--|------|---|
| 12 | 规划支持系统框架体系及典型应用研究 | 全国优秀城乡规划设计三等奖 | 设计奖 | 黄晓春; 龙瀛; 何莲娜; 程辉; 喻文承; 王强; 张鑫; 王蓓; 廖昭华; 柴华 |
| 13 | Measurements of volatile organic compounds in aircraft cabins. Part II: Target list, concentration levels and possible influencing factors | Building and Environment 国际期刊 2014 年度最佳青年论文奖 | 论文奖 | Jun Guan, Chao Wang, Kai Gao, Xudong Yang, Chao-Hsin Lin, Caiyun Lu |
| 14 | Deposition Velocity of Fine and Ultrafine Particles onto Manikin Surfaces in Different Air Speed Indoor Environments | Best Poster Award | 论文奖 | 李愔, 施珊珊, 赵彬 |
| 15 | 中国建筑节能年度发展研究报告 | 2014 年度能源软科学研究优秀成果奖 二等奖 | 科研奖 | 魏庆芃等 |
| 16 | 构建北京市建筑节能体系的关键技术研究与应用 | 北京市科学技术奖 三等奖 | 科研奖 | 魏庆芃等 |
| 17 | 机场车站类高大空间新型空调系统的研究及应用 | 第六届中国制冷学会科学技术进步奖 一等奖 | 科研奖 | 刘晓华等 |
| 18 | 再生 再生热源特性对两级除湿转轮系统的性能影响分析 | 2014 年第十九届全国暖通空调制冷学术年会青年优秀论文 | 科研奖 | 刘晓华等 |
| 19 | 辐射地板供冷在航站楼高大空间中的应用 | 2014 年第十九届全国暖通空调制冷学术年会优秀论文 | 科研奖 | 刘晓华等 |
| 20 | 室内可吸入颗粒物动力学问题研究 | 教育部自然科学奖二等奖 | 科研奖 | 赵彬、吴俊、李先 |

| 序号 | 项目名称 | 奖项名称 | 奖励类型 | 完成人 |
|----|-------------------|-------------------|------|---------------------------|
| | | | | 庭、陈淳、杨旭东 |
| 21 | 规划支持系统框架体系及典型应用研究 | 北京市科学技术三等奖 | 科研奖 | 黄晓春; 龙瀛; 何莲娜; 程辉; 喻文承; 王强 |
| 22 | --- | 2014 年华夏建设科学技术二等奖 | 科研奖 | 党安荣 |
| 23 | --- | 中国科协优秀工作者奖 | 个人奖 | 张寅平 |
| 24 | --- | 优秀工作者奖 | 个人奖 | 张寅平 |
| 25 | --- | 中组部万人计划科技创新领军人才 | 个人奖 | 林波荣 |

五、开放交流与运行管理

2014 年度, 实验室共承担了 3 次大型学术会议, 在国内外大型会议中做特邀报告为 16 人次。

1. 承办大型学术会议一览表

| 序号 | 会议名称 | 主办单位名称 | 会议主席 | 召开时间 | 参加人数 | 类别 |
|----|----------------------------|----------|------|---------|------|------|
| 1 | 2014 中国城市规划年会专题会议-居住区规划 | 中国城市规划学会 | 石楠 | 2014.9 | 200 | 国内会议 |
| 2 | 2014 中国城市规划年会自由论坛-大数据与城乡治理 | 中国城市规划学会 | 石楠 | 2014.9 | 300 | 国内会议 |
| 3 | 清华大学建筑节能学术周 | 清华大学 | 江亿 | 2014.3. | 200 | 国内会议 |

2.大型学术会议做特邀报告

| 序号 | 姓名 | 会议名称 | 报告题目 | 时间/地点 |
|----|----|--|--|------------------|
| 1 | 袁昕 | 2014 年城市规划年会 | 城乡治理与数据开放 | 2014.9 海口 |
| 2 | 胡洁 | 第四届园冶高峰论坛 | 山水城市—中国城市可持续发展的探索 | 2014.1 北京 |
| 3 | 胡洁 | Annual Meeting of Council of Educators in Landscape Architecture | 1. Longwan Central Business District Landscape Planning and Design in Huludao City Future Scientific 2. Technology City of Beijing Landscape Planning and Design | 2014.3 美国 |
| 4 | 胡洁 | The 1st Middle East Smart Landscape Summ | Beijing Olympic Park Planning and Design | 2014.5 迪拜 |
| 5 | 胡洁 | The 12th Annual Conference of the Israeli Landscape Architects Association | Shanshui City-Exploring Sustainable Urban Development in China | 2014.10 以色列 |
| 6 | 胡洁 | 北京 建筑·场地一体化设计高峰论坛 | 山水城市 梦想人居 | 2014.10 北京 |
| 7 | 胡洁 | The 4th International Envirocities Conference 2014 'Landscape Architecture to Enhance Sustainable Development of Cities' | Shanshui City-Exploring Sustainable Urban Development in China | 2014.12 沙特阿拉伯 |

| 序号 | 姓名 | 会议名称 | 报告题目 | 时间/地点 |
|----|-----|--|--|--------------------------|
| 8 | 闫琳 | 2014 中国城市规划年会 | 基于乡村可持续发展和社区营造理念的村庄规划方法研究 | 2014 中国海口 |
| 9 | 董晓莉 | 2014 中国城市规划年会 | 生态脆弱-文化资源富集地区城乡发展战略研究 | 2014.9 中国海口 |
| 10 | 燕达 | Annex 66 1st Preparation Phase Meeting | IEA EBC ANNEX 66:Definition and Simulation of Occupant Behavior in Buildings | 2014.3 中国香港 |
| 11 | 李先庭 | The 7th Asian Conference on Refrigeration and Air Conditioning Organizing Committee 第7届亚洲制冷大会 | RESEARCH AND DEVELOPMENT OF ENERGY EFFICIENT EQUIPMENT AND SYSTEM FOR COOLING AND HEATING | 2014.5 韩国 |
| 12 | 莫金汉 | 1st Energy & Environment (E&E) International Conference | Photocatalytic oxidation for indoor air purification: mechanism, advantages and challenges | 2014.10 韩国首尔 |
| 13 | 燕达 | Annex 66 2nd Preparation Phase Meeting | ANNEX 66 Definition and Simulation of Occupant Behavior in Buildings | 2014.8 Nottingham, UK |
| 14 | 杨旭东 | 第13届国际室内空气质量与气候学术会议 (Indoor Air 2014) | —— | 2014.7 香港 |
| 15 | 张寅平 | 第13届可持续能源技术国际会议 13th | —— | 2014.08 瑞士日 |

| 序号 | 姓名 | 会议名称 | 报告题目 | 时间/地点 |
|----|----|--|--|-------|
| | | International conference on sustainable energy | | 内瓦 |
| 16 | 付林 | 14th International Symposium on District Heating and Cooling | Key Note Speaker presentation: Building super large District Heating systems for using waste heat in North China | --- |

3.邀请专家来室访问或讲学一览表

| 序号 | 来访事由 | 报告人 | 时间 | 邀请人 |
|----|--------------|------------------------------------|-----------------------|------|
| 1 | 合作研究、学术访问 | Charles J. Weschler | 2014.05.15-2014.07.15 | 张寅平 |
| 2 | 合作研究、学术访问 | John C. Little | 2014.06.15-2014.07.15 | 张寅平 |
| 3 | 学习交流 | Chin, Chang zhang | 2014.3.28-2014-09.23 | 张寅平 |
| 4 | 学术交流与访问 | Carsten Rode | 2014.7.12-7.15 | 杨旭东 |
| 5 | 学术交流与访问 | Gary Adamkiewicz | 2014.7.1-7.20 | 杨旭东 |
| 6 | 学术交流与访问 | John Daniel Spengler | 2014.3.30-7.4 | 杨旭东 |
| 7 | 学术交流与访问 | Joseph Michael Hunt | 2014.4.1-7.1 | 杨旭东 |
| 8 | 学术交流和合研究 | Ricardo Luís Teles de Carvalho | 2014.6.23-7.14 | 杨旭东 |
| 9 | 参会、学术交流、合作研究 | MajidEzzati | 2014.12.4-12.9 | 杨旭东 |
| 10 | 参会、学术交流、合作研究 | Jill Baumgartner | 2014.12.4-12.9 | 杨旭东 |
| 11 | 参会、学术交流、合作研究 | Jamie Schauer | 2014.12.4-12.9 | 杨旭东 |
| 12 | 参会、学术交流、合作研究 | Christine Weidinmyer | 2014.12.4-12.9 | 杨旭东 |
| 13 | 参会、学术交流、合作研究 | Ellison Carter | 2014.12.4-12.9 | 杨旭东 |
| 14 | 学术访问 | Lebrun | 2014.11 | 谢晓云等 |
| 15 | 学术访问 | Tobias Zegenhagen, Cristina Ricart | 2014.1 | 谢晓云等 |

4.研究生参加国际会议情况

| 序号 | 参加会议形式 | 参加会议研究生 | 参加会议名称 | 会议主办方 | 参加会议年度 |
|----|-------------------|---------|--------------------------------------|--|--------|
| 1 | 口头报告 | 曹建平 | 2014 中日韩三国学术交流会 | 清华大学 | 2014 |
| 2 | 报告 | 薛斐 | 7th J-G meeting on urban climatology | | 2014 |
| 3 | 论文作者 | 崔莹 | IBPSA Asia Conference 2014 | International Building Performance Simulation Association | 2014 |
| 4 | 报告 | 汤雨桥 | Indoor Air 2014 | ISIAQ | 2014 |
| 5 | 报告 | 齐美薇 | Indoor Air 2014 | ISIAQ | 2014 |
| 6 | 报告 | 李灏如 | Indoor Air 2014 | ISIAQ | 2014 |
| 7 | 海报 | 薛斐 | Indoor Air 2014 | ISIAQ | 2014 |
| 8 | 报告 | 王莹 | Indoor Air 2014 | ISIAQ | 2014 |
| 9 | 口头演讲 | 陈哲良 | IndoorAir2014（室内空气质量大会） | 香港大学 | 2014 |
| 10 | Oral presentation | 王升 | ISHPC2014 国际吸收式热泵大会 2014 | Center for Environmental Engineering, University of Maryland | 2014 |
| 11 | Oral presentation | 李静原 | ISHPC2014 国际吸收式热泵大会 2014 | Center for Environmental Engineering, University of Maryland | 2014 |
| 12 | Oral presentation | 郑姝影 | ISHPC2014 国际吸收式热泵大会 2014 | Center for Environmental Engineering, University of Maryland | 2014 |
| 13 | Oral presentation | 朱超逸 | ISHPC2014 国际吸收式热泵大会 2014 | Center for Environmental Engineering, University of Maryland | 2014 |
| 14 | 口头报告 | 张朋磊 | Purdue 2014 第 22 届普渡国际压缩机会议 | 2014 普渡会议组委会 | 2014 |

| 序号 | 参加会议形式 | 参加会议研究生 | 参加会议名称 | 会议主办方 | 参加会议年度 |
|----|-----------|---------|--|-----------------------------------|--------|
| 15 | 口头报告 | 裴祖峰 | Sustainability in Energy and Buildings 2014 Conference (可持续能源与建筑会议) | KES | 2014 |
| 16 | 口头报告 | 裴祖峰 | The 13th International Conference on Indoor Air Quality and Climate (第13届室内空气品质与气候国际会议) | The University of HongKong (香港大学) | 2014 |
| 17 | 口头报告 | 罗茂辉 | The 13th International Conference on Indoor Air Quality and Climate (第13届室内空气品质与气候国际会议) | The University of HongKong (香港大学) | 2014 |
| 18 | 口头报告 | 崔惟霖 | The 13th International Conference on Indoor Air Quality and Climate (第13届室内空气品质与气候国际会议) | The University of HongKong (香港大学) | 2014 |
| 19 | 口头报告 | 李敏 | The 13th International Conference on Indoor Air Quality and Climate (第13届室内空气品质与气候国际会议) | The University of HongKong (香港大学) | 2014 |
| 20 | 论文作者 | 丰晓航 | The 13th International Conference on Indoor Air Quality and Climate | The University of Hong Kong | 2014 |
| 21 | 口头报告 | 梁超 | The 13th International Conference on Indoor Air Quality and Climate Organization 第十三届室内空气品质与室内气候国际会议 | 第十三届室内空气品质与室内气候国际会议组委会 | 2014 |
| 22 | Oral | 施珊珊 | The 13th International Conference on Indoor Air Quality and Climate | ISIAQ 和香港大学 | 2014 |
| 23 | Oral 口头报告 | 纪文静 | The 13th International Conference on Indoor Air Quality and Climate | ISIAQ 和香港大学 | 2014 |
| 24 | | 张堙 | The 14th Seoul National-Kyoto-Tsinghua University Thermal Engineering Conference | 国立首尔大学 | 2014 |
| 25 | | 张堙 | The 6th International Conference on Applied Energy | 台湾科技大学 | 2014 |
| 26 | | 熊飞 | The 6th International Conference on Applied Energy | 台湾科技大学 | 2014 |
| 27 | | 商锐 | The 6th International Conference on Applied Energy | 台湾科技大学 | 2014 |
| 28 | | 卓思文 | The 6th International Conference on Applied Energy | 台湾科技大学 | 2014 |

| 序号 | 参加会议形式 | 参加会议研究生 | 参加会议名称 | 会议主办方 | 参加会议年度 |
|----|--------|---------|---|--|--------|
| 29 | | 滕小果 | The 6th International Conference on Applied Energy | 台湾科技大学 | 2014 |
| 30 | 口头报告 | 杨明洪 | The 7th Asian Conference on Refrigeration and Air Conditioning Organizing Committee 第7届亚洲制冷大会 | 第7届亚洲制冷大会组委会 | 2014 |
| 31 | 口头报告 | 李宁 | The 7th Asian Conference on Refrigeration and Air Conditioning Organizing Committee 第7届亚洲制冷大会 | 第7届亚洲制冷大会组委会 | 2014 |
| 32 | 口头报告 | 罗茂辉 | The 8th Windsor Conference (第八届温莎会议-室内环境舒适的代价研讨) | The Scientific Organising Committee of the Windsor Conference 2014 | 2014 |
| 33 | 海报 | 李敏 | The 8th Windsor Conference (第八届温莎会议-室内环境舒适的代价研讨) | The Scientific Organising Committee of the Windsor Conference 2014 | 2014 |
| 34 | 口头报告 | 王鹏苏 | 第13届国际室内空气品质与气候学术会议(Indoor Air 2014) | ISIAQ | 2014 |
| 35 | 口头报告 | 孙筱 | 第13届国际室内空气品质与气候学术会议(Indoor Air 2014) | ISIAQ | 2014 |
| 36 | 口头报告 | 梁卫辉 | 第13届国际室内空气品质与气候学术会议(Indoor Air 2014) | ISIAQ | 2014 |
| 37 | 口头报告 | 杨琿 | 第13届国际室内空气品质与气候学术会议(Indoor Air 2014) | ISIAQ | 2014 |
| 38 | 口头报告 | 解加荣 | 第13届国际室内空气品质与气候学术会议(Indoor Air 2014) | ISIAQ | 2014 |
| 39 | 口头报告 | 李佳蓉 | 第13届国际室内空气品质与气候学术会议(Indoor Air 2014) | ISIAQ | 2014 |
| 40 | 口头报告 | 栾亚萌 | 第13届国际室内空气品质与气候学术会议(Indoor Air 2014) | ISIAQ | 2014 |
| 41 | 口头报告 | 章沁 | 第13届国际室内空气品质与气候学术会议(Indoor Air 2014) | ISIAQ | 2014 |
| 42 | 论文张贴 | 蔚文娟 | 第13届国际室内空气品质与气候学术会议 The 13th International Conference on Indoor Air Quality and Climate | ISIAQ | 2014 |

| 序号 | 参加会议形式 | 参加会议研究生 | 参加会议名称 | 会议主办方 | 参加会议年度 |
|----|--------|---------|--|--|--------|
| 43 | 口头报告 | 杜正健 | 第 13 届国际室内空气品质与气候学术会议 The 13th International Conference on Indoor Air Quality and Climate | ISIAQ | 2014 |
| 44 | 口头报告 | 王丽芳 | 第 13 届国际室内空气品质与气候学术会议 The 13th International Conference on Indoor Air Quality and Climate | ISIAQ | 2014 |
| 45 | 口头报告 | 向建帮 | 第 13 届国际室内空气品质与气候学术会议 The 13th International Conference on Indoor Air Quality and Climate | ISIAQ | 2014 |
| 46 | 口头报告 | 龚梦艳 | 第 13 届国际室内空气品质与气候学术会议 The 13th International Conference on Indoor Air Quality and Climate | ISIAQ | 2014 |
| 47 | 口头报告 | 曹建平 | 第 13 届国际室内空气品质与气候学术会议 The 13th International Conference on Indoor Air Quality and Climate | ISIAQ | 2014 |
| 48 | 论文张贴 | 蒲中南 | 第 13 届国际室内空气品质与气候学术会议 The 13th International Conference on Indoor Air Quality and Climate | ISIAQ | 2014 |
| 49 | 口头报告 | 黄少丹 | 第 13 届国际室内空气品质与气候学术会议 The 13th International Conference on Indoor Air Quality and Climate | ISIAQ | 2014 |
| 50 | 口头报告 | 曹建平 | 第 15 届国际传热大会 The 15th International Heat Transfer Conference Kyoto 2014 | The Heat Transfer Society of Japan and Science Council of Japan (日本传热学会与日本科学理事会) | 2014 |
| 51 | | 王鹏苏 | 第十一届热、湿及污染物技术研讨会 (The 11th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations) | 清华大学 | 2014 |

| 序号 | 参加会议形式 | 参加会议研究生 | 参加会议名称 | 会议主办方 | 参加会议年度 |
|----|-------------------|---------|--|---|--------|
| 52 | | 孙筱 | 第十一届热、湿及污染物技术研讨会 (The 11th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations) | 清华大学 | 2014 |
| 53 | | 梁卫辉 | 第十一届热、湿及污染物技术研讨会 (The 11th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations) | 清华大学 | 2014 |
| 54 | | 杨琄 | 第十一届热、湿及污染物技术研讨会 (The 11th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations) | 清华大学 | 2014 |
| 55 | | 解加荣 | 第十一届热、湿及污染物技术研讨会 (The 11th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations) | 清华大学 | 2014 |
| 56 | | 李佳蓉 | 第十一届热、湿及污染物技术研讨会 (The 11th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations) | 清华大学 | 2014 |
| 57 | | 栾亚萌 | 第十一届热、湿及污染物技术研讨会 (The 11th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations) | 清华大学 | 2014 |
| 58 | | 章沁 | 第十一届热、湿及污染物技术研讨会 (The 11th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations) | 清华大学 | 2014 |
| 59 | Oral presentation | 王升 | ISHPC2014 国际吸收式热泵大会 2014 | Center for Environmental Engineering, University of Maryland | 2014 |

| 序号 | 参加会议形式 | 参加会议研究生 | 参加会议名称 | 会议主办方 | 参加会议年度 |
|----|-------------------|---------|--------------------------|--|--------|
| 60 | Oral presentation | 李静原 | ISHPC2014 国际吸收式热泵大会 2014 | Center for Environmental Engineering, University of Maryland | 2014 |
| 61 | Oral presentation | 郑姝影 | ISHPC2014 国际吸收式热泵大会 2014 | Center for Environmental Engineering, University of Maryland | 2014 |
| 62 | Oral presentation | 朱超逸 | ISHPC2014 国际吸收式热泵大会 2014 | Center for Environmental Engineering, University of Maryland | 2014 |

5.开放课题设置情况

| 序号 | 项目/课题名称 | 负责人 | 牵头单位 | 开始时间 | 结束时间 | 经费(万元) |
|----|---|---------------------|--|--------|---------|--------|
| 1 | Assessment of alternative eco-planning and green building scenarios for dense urban areas | Koen Steemers | 英国剑桥大学建筑系 | 2013.1 | 2015.12 | 40 |
| 2 | 基于手机调研数据的城市交通模拟方法研究及北京城市空间发展策略情景评估 | 姚晓白 | 美国乔治亚大学、瑞典 Gävle 大学 | 2013.1 | 2015.12 | 40 |
| 3 | 集合住宅的外围护体系的劣化诊断与维修更新研究 | 松村秀一 | 日本东京大学大学院工学系研究科；清华大学建筑学院（姜涌） | 2013.1 | 2015.12 | 40 |
| 4 | 降低室外颗粒物及复合污染对室内影响的控制技术研究 | Charles J. Weschler | University of Medicine and Dentistry of New Jersey | 2013.1 | 2015.12 | 40 |
| 5 | 超大城市冠层内气温日循环变化规律 | 李玉国 | 香港大学 | 2013.1 | 2015.12 | 40 |
| 6 | 利用基因算法的适应性建筑立面优化配置研究 | Luisa Caldas | 美国加州伯克利大学，清华 | 2013.1 | 2015.12 | 20 |

| 序号 | 项目/课题名称 | 负责人 | 牵头单位 大学建筑学院 (王嘉亮) | 开始 时间 | 结束 时间 | 经费 (万元) |
|----|---|-----|---------------------------|------------|-------------|------------|
| 7 | 室外热舒适评估模型的研发 | 陈清焰 | 美国普渡大学 | 2013. 1 | 2015.1 2 | 20 |
| 8 | 北京地区“被动房”建筑(Passive House)适宜性研究 | 周正楠 | 清华大学建筑学院, 比利时代尔福特大学 | 2013. 1 | 2015.1 2 | 20 |
| 9 | 国际生态城市规划关键技术的适用性及在我国实践中的优化组合研究 | 张若曦 | 厦门大学 | 2013. 1 | 2015.1 2 | 15 |
| 10 | 面向局部需求的建筑内高大空间热湿环境营造方法研究 | 马晓钧 | 北京市建筑设计研究院, 清华大学建筑学院(李先庭) | 2013. 1 | 2015.1 2 | 15 |
| 11 | 基于城市生态气候图的空间环境协调机理与优化方法研究 | 林姚宇 | 哈尔滨工业大学深圳研究生院 | 2013. 1 | 2015.1 2 | 15 |
| 12 | 夏热冬冷地区公园绿地对城市微气候改善的设计方法研究 | 谢俊民 | 同济大学绿色建筑及新能源研究中心 | 2013. 1 | 2015.1 2 | 15 |
| 13 | 住宅小区周围颗粒物污染模型的建立与模拟方法研究 | 赵彬 | 清华大学建筑学院建筑技术科学系 | 2013. 1 | 2015.1 2 | 15 |
| 14 | 基于地域性因子分析的城市雨洪调蓄型绿地构建与评估方法 | 刘海龙 | 清华大学建筑学院景观学系 | 2013. 1 | 2015.1 2 | 15 |
| 15 | 基于 SI 体系下的保障性住宅部品集成化与性能评价体系研究——以集装箱住宅研究为例 | 王蔚 | 清华大学建筑学院住宅与社区研究所 | 2013. 1 | 2015.1 2 | 15 |

第三部分 代表性论文

Advanced Materials Research
ISSN: 1662-8985, Vols. 962-965, pp 2023-2026
doi:10.4028/www.scientific.net/AMR.962-965.2023
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Online: 2014-06-18

Dignitary Interests Groups are the Biggest Obstacles to Solve China's Environmental Problems

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Keywords: Dignitary interests groups, China, Reform

Abstract. China has carried out its reform since 1978. With economic booming, reform in political system followed behind so that three dignitary interests groups have formed: monopolistic entrepreneurs of state-owned companies, bigwig capitalists and bureaucratic corrupters. They are the biggest beneficiary under such a political system and they are also the original cause of social injustice and conflicts. In order to preserve their existing right, they spare no efforts to support current privileged system. They are opposed to the political reform by disturb legislation system and law enforcement. How to break the obstacles from dignitary group and achieve the goal of political reform is one of the most difficult challenges in China.

The Lag of Political Reform of China Results in Germination of Dignitary Interests Groups

Since economic reform, China's GDP jumped from 57.86 billion US dollar in 1978 to 7485.14 billion US dollar in 2011. Correspondingly, GDP per capita soared from 60.48 US dollar per capita to 5568.73 US dollar per capita^[1]. However, because Chinese government follows a gradual reform principle, political reform is following behind economic reform. Although a primary framework of market economy has been established, the old management style of centrally planned economy is not overturned. As a result, the market is manipulated by monopolists and privileged powers. They control the resource allocation and seek rent. The majority of social wealth has been grabbed by the minority dignitary interests groups.

Dignitary interests groups are mainly composed by three sub-groups. Monopolistic entrepreneurs of state-owned companies are those who enjoy the monopolistic huge profits of state-owned companies; bigwig capitalists are those who have connections with officials to develop their enterprises; bureaucratic corrupters are those who use authority for rent seeking.

Monopolistic Entrepreneurs of State-owned Companies. In China, state-owned capital dominates the most profitable businesses and constructs monopoly. These businesses include banks, railways, airlines, oil, electricity, telecom, foreign trade, tobacco, notarisation and insurance. These companies can not only enjoy the benefits from monopolistic resources, but can utilise official power to protect their interests. For example, they can cooperate with official within their respective field to formulate regulations and rules which benefit themselves^[2].

Bigwig Capitalists. This group cooperates with bureaucratic group to reinforce their privileges, for example, real estate developers and bosses of former state-owned companies which are now privatised as their own enterprises. They work with official powers and utilise public power for rent seeking. In this way, their power is converted to money. This millionaire group with typical Chinese characters is often called 'red head businessman', which refers this group accumulates original capital by abusing related power. A survey showed that among 20,000 Chinese billionaires, 90% are relatives of high rank officials^[3].

Bureaucratic Corrupters. Bureaucratic corrupters refer to official corrupters in government of every level. Because the lag of political reform, the institution of power restriction and democratic scrutiny

Cooling extent of Green parks: A case study in Beijing

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Keywords: Effect assessment, Cooling extent, Green Area, Beijing

Abstract. Cooling effects of green areas are an effective way to mitigate the urban higher temperature caused by urban heat islands. The cooling extent goes beyond a green area's boundary and extends into its surrounding area. However, measurement of the exact cooling extent and mechanism of such effects had remained unclear. Using Landsat Enhanced Thematic Mapper Plus (ETM+) images of Beijing, we have determined the lower temperature of green cooled areas by land surface temperature, identified green areas' cooling extents, and evaluated the relation of cooling extents to green areas' features. Results show that the total size of extended cooled areas is larger than that of total green areas, and the cooling extents and magnitudes are statistically related to the biomass, size and shape of green areas. This study has demonstrated the calculation of cooling extents, and provided an approach to the assessment of cooling effects.

Introduction

Cooling effect of a green area refers to the fact that the temperature of the green area and its surroundings is lower than that of external urban built-up area due to plant evapotranspiration and tree shade^[1]. As an effective way to cool a city^[2,3], cooling effects of green areas play an important role in the mitigation of urban heat island effect, which is becoming more serious with the growth of urban built-up area^[4]. Much attention has been paid to the study of the cooling effects of green areas. Previous work along this line has focused mainly on two aspects. One is the time change of temperature difference between a green area and its surroundings during a day, a year or even a longer period^[5-7]. The other is the spatial extension of lower temperature into the surroundings of a green area^[8-10], which involves the spatial distribution of cooling extent.

Because the cooling extent of a green area is difficult to calculate directly, this paper focuses on the assessment of the relationship between temperature difference and green area features, such as biomass, size and shape. Cooling extent is a basic component in determining a green area's cooling effect. Upmanis summarized the extension of lower temperature from park border into surrounding built-up areas and found that extension of the park climate into the built-up area increased with increasing park size^[10]. Lee suggested that the height of surrounding areas would affect the cooling extent of a green area^[9]. However, previous work obtained data by on-site measurement of temperature, and could not sample densely enough to outline the cooling extent exactly. Therefore, calculation of a green area's cooling extent remains imprecise and the mechanism of cooling effect is still not well understood.

Assessment of cooling effects concerns the influence of green areas' features on the temperature difference between green areas and their surroundings. The difficulties lie in the acquisition approach of large amount of temperature data required to study the general pattern of cooling effects statistically. To acquire temperature data, previous studies mainly utilized on-site measurement by thermometer, either stationary in a fixed observation point or mobile in an observation car^[8,4,11,12]. This method can obtain data at any time point and over any desired long period, but is limited by the

Mass Incidents Push Government to Curb Environmental Pollution in China's Urbanization

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Keywords: mass incidents, environmental pollution, China's urbanization

Abstract. Cities in China have developed rapidly since economic reform. Meanwhile, mass incidents have happened more frequently. The annual growth rate of mass incidents has exceeded that rate of urban population growth and mass incidents have become a serious threaten to further urbanization in China. We first analyse the reason of rapid growth number of mass incidents, then point out that job supplement will trigger severer mass incidents and the development mode of sacrificing environment for economic growth will incur more mass incidents, both of which will be obstacles for China's urbanization. Therefore we suggest that Chinese government should implement institution reform to overcome these obstacles.

Increasing Number of Mass Incidents

In 2011, urbanization ratio of China mainland (excluding Taiwan, Hong Kong and Macau) has reached 51.27%. It was the first time that number of urban population of China exceeded rural population. In 1978, urbanization ratio was only 17.92%, which indicates 1.01% growth rate over 33 years from 1978 to 2011. With the growth of urbanization ratio, mass incidents occurred more frequently over the last 20 years. The growth rate of mass incidents has exceed that rate of urban population growth and mass incident has become a severe threaten to the urbanization process of China.

In 1993, urbanization rate of China was 28.14% while there were approximately 10,000 mass incidents. However in 2011, the number of mass incidents reached 182,500 (see Table 1). From 1993 to 2011, urban population growth rate was 4.12% while mass incidents growth rate was 17.51%, which is much higher.

Table 1: Urban population and land use area in 1993 and 2011 in China

| Year | 1993 | 2011 |
|--|---------|---------|
| Urban population[million] ^[1] | 333.51 | 690.79 |
| Urban built-up area[km ²] ^[2] | 17416 | 43603 |
| Overall population of China[million] ^[1] | 1185.17 | 1347.35 |
| Urbanization ratio[%] | 28.14 | 51.27 |

Urbanization reflects the process of urban population growth and urban land use expansion. In China, urban land belongs to the state while rural land belongs to farmer collectives. Therefore, urbanization is also a process of transferring rural collective-owned land into state-owned urban land. Expropriation is a widely used measurement in transferring collective-owned land to state-owned land. Therefore, whether expropriations could be carried out smoothly is crucial for China's urbanization process. In and after expropriation, there are all kinds of conflicts in profit distribution. As conflicts accumulate, mass incidents erupt. As Table 2 shows, estimated by official and

与自然共同生长的城市绿色空间

——基于生境网络视角的城市绿色空间规划思路探讨

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【摘要】城市生态基底的健康与稳定是城市可持续发展的生态保障，城市绿色空间是城市发展所依赖的重要生态组成，其保护与规划调控对识别、预警与有效规避城市空间未来的生态隐患具有重要意义。本文基于生境网络视角，以大连旅顺口区西部临港新城核心区为研究区，在对研究区城市活动及其生态组成的时空特征识别的基础上，分别从生态区尺度、城市尺度、城市内部组团等多级尺度进行其生境网络分析，以之前提探讨与自然共同生长的城市绿色空间规划思路，以期为新城可持续发展提供健康、安全的生态载体。

【关键词】城市绿色空间；生境网络；生态载体；可持续性

1. 引言

城市像大自然生境支撑下的生态体一样，从胚胎到成熟乃至衰老或最终消失，都无不依赖与它一直试图脱离的生态环境^[1]。城市作为人类活动形式更复杂、更高级的系统，由于其自身缺失生产与分解性生态系统，生产生活需要的能量与物质及产生的废弃物均需依赖于其周边的生态系统。随着城市化进程不断加剧，在其给人类带来诸多便利的同时，也对其周边的生境带来诸如原始自然生态系统萎缩、生境破碎化及环境污染等一系列严重的生态问题^[2-4]。经济发展与生态环境保护之间的矛盾调和成为城市可持续发展的关键。

城市绿色空间（Green Space）作为城市空间发展依赖的生态系统，具有生态支撑、资源供给、环境调节，及休闲、文化与教育等重要生态服务功能^[5]。近年来强调城市绿色空间保护和规划调控的城市可持续规划研究受到普遍关注^[6-8]。目前的城市绿色空间规划较多以城市建设活动对绿地的功能性需求为主导，以城市园林绿地系统组分为空间形式（包括公园绿地、防护绿地、居住区绿地、附属绿地及其他绿地等）。其弱化了对城市人工生态系统有效补给的更大区域生态系统的健康及两者之间生境网络的维护，使得城市生态系统与其周边自然生境出现各自的孤立化生存，不仅减弱了市域生态系统的稳定性，还增加了不必要的人工维护成本。若在绿地系统规划中，加入更大尺度的生态过程研究结果与规律，并将自然生态过程与城

市人工生境相联系进行全局思考，构筑一个具有自组织生长特性的生境网络，不仅有助于低成本维护城市生态基底的长期稳定，更有益于城市自身的持续发展。

本文以大连旅顺口区西部临港新城核心区绿色空间规划为案例探讨基于生境网络视角的与自然共同生长的城市绿色空间规划思路，以期在城市生态保护与空间规划调控提供有益思路与方法参考。

2. 城市绿色空间内涵

国际上对绿色空间（Green Space）的概念主要包括几种：（1）城市开敞空间（Open space）：以其范围上不围合，其上建筑用地面积小于某一指标，且以休闲娱乐、生态涵养、废弃物堆积等用地功能为特征的城市空间组分，多强调其开放性与自然性；（2）城市范围内的生态类用地：包括城市内园林绿地、湿地水域、自然保护区、各类农业用地等，主要强调其生态要素的整体性、系统性，及其生态服务价值^[9]，也是本文的研究对象；（3）城市绿地：具体为城市公园绿地、生产绿地、防护绿地，附属绿地与其他绿地等^[9]，强调城市内绿地的景观生态功能。还有如绿地系统^[10]、绿道网络^[11]等其他有关城市绿色空间的理解。

城市绿色空间根据其特征组分及人类干预程度可将其划分为：自然生态系统、自然—人工生态系统、



LANDSCAPE PLANNING AND DESIGN FOR TANGSHAN NANHU CENTRAL PARK 唐山南湖中央公园规划设计

胡洁 / HU Jie

摘要: 采煤业是推动唐山城市发展的主要驱动力, 130 余年的煤矿开采造成该市地表塌陷多达 17.34km²。南湖位于唐山市中心以南 1km, 是全市采煤塌陷区中对城市影响最大的一处。经过一个多世纪的采煤与沉陷, 加之 1976 年唐山地震的破坏, 这里成了人迹罕至的废弃地, 市区排放的雨水、污水、各种垃圾以及电厂的粉煤灰都汇集于此, 形成巨型垃圾山。项目以“废墟中生长出来的城市”作为设计理念, 根据自然环境条件, 结合景观策略、生态技术措施, 在生态适宜性分析的基础上, 营建南湖生态城中央公园, 将区域内现存的和潜在的对人类和生态的危险彻底根除。

Abstract: Although the coal mining industry is the main driving force during urban development of Tangshan, its 130 years mining history results in land subsidence up to at least 17.34 square kilometers. Nanhua area, located about one kilometer south to the city center, is the largest sunken area in the mining region. A century's coal excavation, together with the earthquake in 1976, turned the area into a wasteland with a huge garbage hill out of rainfall, sewage, various rubbish and coal ash from power plants. Based on the status quo, we took "a city generated from a wasteland" as our design concept and created Nanhua Central Park in accordance with the natural environment, landscape strategies, ecological technologies and suitability, so as to thoroughly eliminate the existing and potential threat to human and the ecology.

关键词: 棕地 采煤沉陷 公园 景观设计

Key Words: Brownfield, Coal Mining Subsidence, Green Park, Landscape Design

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超高层建筑环境性能模拟优化研究

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摘要 本文基于几个典型超高层建筑的设计实践,从模拟研究辅助建筑设计角度,分析了超高层建筑在建筑环境性能方面经常遇到的设计问题,并基于上述问题提出了模拟在改善建筑环境性能提升的综合技术策略,以及与建筑形态、空间平面设计以及机电系统相结合,协同提升超高层建筑环境性能。

关键词 超高层,环境性能优化,建筑模拟,设计策略

1、引言

超高层建筑因其展示社会、经济发展,提升城市地区地位形象以及土地集约利用效率而日渐受到城市建设与开发者青睐。虽然根据我国相关规定,将超过100m的均称为超高层建筑,但目前我国的超高层建设愈加往高度越来越高、体量越来越大方向发展。

我国超高层建筑是从自1990年建成的北京京广中心首次超过200m以来,我国高层建筑正迅速从沿海特大城市向全国大中城市

发展。据不完全统计,我国已成为世界上超高层建筑发展的中心之一,全球已建成高度居前10的建筑中,我国(包括港澳台)占据50%;全球在建或规划中的超高层建筑,我国占比更高。

超高层的迅猛发展对建筑规划、设计、建造和运行等诸多环节都提出了不同寻常的挑战。超高层的高容积率,多业态,结构形式设计优先考虑,大垂直交通地位凸显以及高能源消耗等因素都对常规的设计,运行提出了更高的要求。近些年来,在绿色建筑大力发展的背景下,基于绿色建筑精细化设计和全过程管控的理念和需求,新的全过程协同规划设计的技术体系开始在我国

基于实际建筑环境的人体热适应研究(2) ——集中供暖与分户独立供暖住宅对比*

清华大学 生态规划与绿色建筑教育部重点实验室 曹彬* 李敏
欧阳沁 朱颖心

摘要 对北京的 5 户集中供暖住户和 5 户使用壁挂炉的住宅进行了持续一个供暖季的现场调查,测量了室内热环境参数,并调查了居民的热舒适状况。结果显示,使用壁挂炉的住宅室内温度比较稳定,平均温度较低,中性温度为 18.6℃;集中供暖住户中性温度为 22.0℃;在相同的室内温度下,壁挂炉用户的热感觉投票值较高,对室内环境的接受度也较高。对独立调控对热适应的影响机理和夏热冬冷地区住宅供暖问题进行了讨论。

关键词 冬季 住宅 集中供暖 分户独立供暖 壁挂炉 热舒适 热适应

Human thermal adaptation in real building environment (2) —Comparison between centralized heating and individual heating in residential buildings

By Cao Bin*, Li Min, Ouyang Qin and Zhu Yingxin

Abstract Conducts a field study in ten residences in Beijing for a whole winter. Among the residences, five are centralized heating (CH) users, and the other five use wall-mounted gas boiler, which is a typical kind of individual heating (IH). Measures indoor environmental parameters, and investigates thermal comfort situation of residents. The results show that the mean indoor temperature of IH residences is stable, and lower than that of CH residences. The neutral temperatures of IH users and CH users are 18.6℃ and 22.0℃ respectively. Compared with CH users, both thermal sensation and acceptability of indoor environment of IH users are higher at the same indoor temperature. Discusses the influence mechanism of individual control on thermal adaptation and heating of residences in hot summer and cold winter area.

Keywords winter, residence, centralized heating, individual heating, wall-mounted gas boiler, thermal comfort, thermal adaptation

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1 研究背景

我国的城镇化进程不断加快,2011 年末城镇人口数量已经超过农村,城镇化率突破 50%^[1]。与此同时,居民对于室内舒适性的要求也在逐步提升。而另一方面,在严峻的能源、资源形势面前,应按照科学发展观和建设生态文明的要求,在为居民提供健康舒适的室内环境的同时,避免能源和资源的浪费。从人体热适应的角度出发,了解不同地区、气候条件、建筑类型等因素影响下,建筑使用者对于室内环境的实际需求,科学

制定室内环境舒适标准和控制策略,是解决上述问题的有效途径。

近年来,笔者基于不同类型建筑环境开展了一系列现场调查研究,分别关注了季节、地域、环境控制方式等因素对人体热适应规律的影响。本文将介绍集中供暖与分户独立供暖住宅的调查对比。与传统的集中供暖相比,分散式供暖手段也正在被

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收稿日期:2013-05-15
一次修回:2013-07-18
二次修回:2014-09-02

* 国家自然科学基金重点项目(编号:50838003),中国博士后科学基金面上项目(编号:2013M530633)



专题
研究

基于实际建筑环境的人体热适应研究 ①

——夏季空调与非空调公共建筑对比*

清华大学 生态规划与绿色建筑教育部重点实验室 曹彬*

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摘要 在夏季对位于北京的3栋非空调公共建筑和3栋集中空调公共建筑进行了现场调查,测量了室内热环境参数,并调查了建筑使用者的热舒适状况,得到非空调环境下人体中性温度为25.7℃,空调环境下中性温度为25.4℃。当室温偏离中性时,空调建筑使用者对温度变化更为敏感。在相同的偏热环境中,空调建筑人体热感觉更高。非空调建筑人群对偏热环境体现出更强的热适应性。与空调建筑相比,长期处于非空调环境中的人们在高温下的生理调节能力和热耐受性较强,对热环境的心理期望较低,更多通过主动开窗或使用电风扇增大风速的方式来改善热感觉。

关键词 夏季 公共建筑 空调环境 非空调环境 热感觉 热舒适 热适应

Human thermal adaptation in real building environment (1) — Comparison between air-conditioned and non-air-conditioned public buildings

By Cao Bin*, Huang Li, Ouyang Qin and Zhu Yingxin

Abstract Conducts a field study in six public buildings in Beijing, three of which are non-air-conditioned and the other three are running with centralized air conditioning system. Measures indoor environmental parameters, and investigates thermal comfort situation of building occupants. The neutral temperature of occupants in non-air-conditioned environment is 25.7℃, while that in air-conditioned environment is 25.4℃. When indoor temperature is higher than neutral temperature in summer, air-conditioned building occupants are more sensitive. Thermal sensation vote (TSV) of non-air-conditioned building occupants is lower than that of air-conditioned building occupants, and non-air-conditioned building occupants show better thermal adaptation to warm environment. People who are used to non-air-conditioned environment have stronger physiological acclimatization and lower expectation. They are more likely to improve their thermal sensation by using natural ventilation or electric fans to enhance air velocity.

Keywords summer, public building, air-conditioned environment, non-air-conditioned environment, thermal sensation, thermal comfort, thermal adaptation

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1 研究背景

传统的人体热舒适研究大多在人工气候室中进行,学者们通过实验提出了一系列用来评价稳态热环境下人体热舒适状态的指标和模型,其中以

Fanger 教授的 PMV 预测模型最具有代表性^[1]。

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收稿日期:2013-05-15

一次修回:2013-07-18

二次修回:2014-07-07

* 国家自然科学基金重点项目(编号:50838003),中国博士后科学基金面上项目(编号:2013M530633)

Energy-Efficient Building Envelopes with Phase-Change Materials: New Understanding and Related Research

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Thermal performance of building envelopes is important in improving building energy efficiency. This paper includes three parts: (1) It introduces our new understanding of developing optimized or ideal building envelopes based upon inverse problems and their solutions, which is helpful for energy efficient building envelope structure design and material development. (2) It reviews our recent research on developing energy-efficient building envelopes with phase-change materials, including the optimized thermal mass characteristics of building wall, novel phase-change material development, measurement method for thermal physical properties of phase-change material, and application of some prototype energy efficient building envelopes. (3) It puts forward some limitations of the available works and related research topics for future study.

INTRODUCTION

With speeding modernization and urbanization, building energy consumption has steadily and rapidly increased in China. China's total energy consumption in 1978 was about 571 million tons of standard coal, while in 2009 it reached 3.07 billion tons [1]. According to the statistical data, the share of building energy consumption in total energy consumption in China rose from 10% in 1978 to 30% in 2006, and keeps increasing [2]. Heating and air conditioning alone account for 65% of the total building energy consumption in 2003 and are still increasing [3], which not only consumes valuable fossil fuel resources, but also emits a huge amount of CO₂ and other pollutants into the atmosphere. Therefore, research related to building energy efficiency is becoming more and more important in China.

Improving the thermal energy storage capacity of a building envelope is an important way to build energy efficiency. Thermal energy storage in building envelopes can be realized either by using conventional sensible heat storage or by latent heat storage. For many cases, the latter demonstrates some advantages over the former, due to (1) higher thermal mass density and

(2) nonlinear specific heat characteristics that benefit building energy efficiency or building thermal performance.

There are many important problems regarding thermal energy storage building envelopes, such as: (1) What is the ideal thermal energy storage building envelope that can maintain indoor thermal comfort with minimal additional energy consumption excluding nature energy resources such as solar energy? (2) How can one prepare proper phase-change materials (PCMs) used in building envelopes and how should one improve thermal physical characteristics of PCMs in order to make them more reliable and economic? (3) How can one develop some easily used, accurate, and rapid methods to test thermal physical properties of PCMs for thermal energy storage in building envelopes? (4) How does one apply building envelopes with PCMs effectively?

In order to answer these important questions, our relating recent research studies are introduced (Figure 1).

NEW UNDERSTANDING FOR DESIGNING AND OPTIMIZING THE THERMAL PERFORMANCE OF BUILDING ENVELOPES

Thermal Functions of the Building Envelope and Its Analysis

Asan et al. [4] pointed out that at the cross section of the outer wall of a building, the temperature profiles are functions of inside temperature, outside temperature, and thermal physical

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Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/ahbe.

Numerical study of the effects of trees on outdoor particle concentration distributions

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Abstract

Outdoor particles are a major contributor to indoor particles which influence the indoor air quality. The outdoor particle concentration also affects the outdoor air quality but the real outdoor particle concentration around buildings may differ from monitored concentrations at monitoring sites. One main factor is the effect of vegetation, especially trees. Numerical simulations were used to investigate the effects of trees on particle concentration distributions around target buildings. The drift flux model was combined with the Reynolds-Averaged Navier-Stokes (RANS) model to model the particle distribution and the airflow. Thirteen cases were analyzed to compare the effects of tree type, tree–building distance and tree canopy–canopy distance on the outdoor particle concentration distribution. The results show that cypress trees reduce the outdoor particle concentration more than pine trees, that shorter tree–building distances (TBD) reduce the particle concentration more than longer tree–building distances, and that a zero tree canopy–canopy distance (CCD) reduces the particle concentration more than $CCD=2$ m. These results provide guidelines for determining the most effective configuration for trees to reduce outdoor particle concentrations near buildings.

1 Introduction

Atmospheric particulate pollution is quite serious in China with China having some of the highest outdoor particulate matter (PM) concentrations in the world (van Donkelaar et al. 2010). However, most human exposure to particles occurs indoors, since most people spend over 85% of their time indoors (Klepeis et al. 2001), but outdoor particles contribute significantly to indoor particle pollution (Abt et al. 2000; Kopperud et al. 2004; Lee et al. 2001; Letz et al. 1984; Turpin et al. 2007; Chen and Zhao 2011). The real outdoor particle concentration around the building may differ from monitored concentrations at monitoring sites. One of the main factors is the effect of vegetation. Plants around buildings remove outdoor particles from the atmosphere by adsorbing particulate matter onto leaf surfaces. Trees, with their large total leaf area, are considered to be the best type of vegetation that most effectively reduces the outdoor particle concentration (McDonald et al. 2007). Thus, trees can reduce street-canyon air pollution and improve the

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outdoor air quality (Kessler 2013) and reduce the amount of outdoor pollutants penetrating into indoor environments.

Some studies have investigated particulate matter accumulation on leaf/needle surfaces, but they mainly focused on the mass of particles deposited on the leaf surfaces (Beckett et al. 2000; Dzierzanowski et al. 2011a; Dzierzanowski et al. 2011b; Freer-Smith et al. 2005; Nawrot et al. 2011; Popek et al. 2013; Sæbø et al. 2012). Terzaghi et al. (2013) studied the role of leaves in capturing and releasing particles and found that plants play a key role in removing particulate matter from the atmosphere. However, these studies ignored the effect of trees on the outdoor particle distributions.

Many previous studies have studied on the behavior of pollutants released near different building environments ranging from street canyons and building arrays to isolated single buildings (Mfula et al. 2005; Lateb et al. 2010; Leung et al. 2012; Liu et al. 2013). However, these studies did not explicitly analyze particle distributions. There are few studies on modeling of atmospheric particle transport and deposition near buildings in the literature. Leuzzi and Monti (1998)

Keywords

particles,
outdoor environment,
indoor environment,
numerical simulation,
trees

Article History

Received: 8 December 2013
Revised: 30 January 2014
Accepted: 6 February 2014

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Springer-Verlag Berlin Heidelberg
2014

Topic A7: Thermal Comfort

Thermal Comfort in an Open Space of an Office Building: A Field Study in Subtropical Region

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Keywords: Open space, Thermal comfort, Subtropical region, Natural ventilation

INTRODUCTION

Ventilation is a very effective way to improve thermal comfort in a warm environment. The application of open space in building design provides feasibility to bring natural ventilation into play. This study focuses on a building which is located in Shenzhen. Shenzhen is a city on the north of Hong Kong, with a typical subtropical climate. Fig. 1 shows the climatic characteristics of Shenzhen according to the records during the recent 30 years.

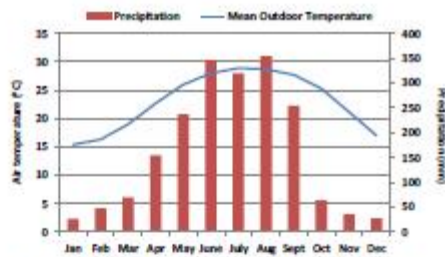


Fig. 1 Climatic characteristics of Shenzhen

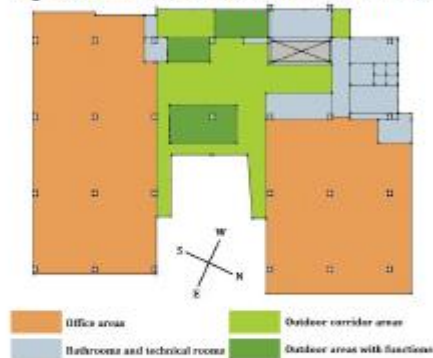


Fig. 3 Schematic map of a floor on the upper part of the building



Fig. 2 The iBR building as viewed from the southeast facade

[Topic B2: Particles](#)

COMPARISON OF CONTRIBUTION OF OUTDOOR PARTICLES BETWEEN INDOOR SOURCES TO INDOOR PM_{2.5} CONCENTRATION AND ASSOCIATED EXPOSURE: A PRELIMINARY MODELING STUDY

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Keywords: Indoor particle concentration, Outdoor particle concentration, Contribution, Exposure, Modeling

SUMMARY

This modeling study is to estimate how much indoor and outdoor originated sources contribute to indoor PM_{2.5} pollution and thus may guide the making of control strategy. The modeling is based on the steady-state form of the mass balance equation. The cases mainly study the impacts of four typical activity patterns (window open & kitchen ventilator (KV) closed, window open & KV open, window closed & KV closed, window closed & KV open) and different air exchange rates on indoor particle concentrations. The results indicate that the indoor particle level is related with indoor and outdoor sources and human activity. Therefore, the management strategy of windows and KV should be decided according to both the indoor and outdoor particle levels.

INTRODUCTION

China faces serious atmospheric PM_{2.5} pollution in recent years. The continuous heavy air pollution in the past years has drawn the attention of the whole society. As modern people spend about 85-90% of their time indoors, the indoor environment is more closely related to human health than the atmosphere (Klepeis et al., 2001; Leech et al., 2002).

Not only can atmospheric PM_{2.5} get indoors, various indoor PM_{2.5} sources can also contribute to the indoor PM_{2.5} pollution. Additionally, indoor air quality studies have demonstrated that concentration levels in typical indoor microenvironments, such as residences, offices, and schools, are significant and often surpass the corresponding ambient levels (Diapouli et al., 2007; Rojas-Bracho et al., 2004;). Particles of indoor and outdoor origins have different size distributions, chemical compositions and toxicity (Ebelt et al., 2005; Wilson et al., 2006). Therefore, it is important to distinguish the contribution of indoor origin particles from that of the outdoor to indoor air.

Numbers of studies have attempted to study the relative contribution of indoor and outdoor origin particles to indoor particle concentrations. The different methods are grouped into four categories: (1) steady-state form of the mass balance equation; (2) dynamic solution of the mass balance equation (3) experimental studies using simplified model calculations; and (4) infiltration surrogates using an outdoor PM tracer (Diapouli et al., 2013). The use of sulfur or sulfate as an outdoor PM_{2.5} tracer is the most common method for estimating the relative

Numerical study of the influences of different patterns of the building and green space on micro-scale outdoor thermal comfort and indoor natural ventilation

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Abstract

Citizens could enjoy a healthy and comfortable living environment if outdoor thermal comfort and sufficient natural ventilation are available in their dwellings. In this paper, numerical studies were performed with the Simulation Platform for Outdoor Thermal Environment (SPOTE) to investigate: (1) the thermal environment and pedestrian thermal comfort of the occupants in the open space with different patterns of the building and green space; (2) the wind pressures on the building facades and the natural ventilation rate of these buildings. The conclusions are summarized as follows: (1) it has been observed that the long facades of building and green space, which are parallel to the prevailing wind direction, can accelerate horizontal vortex airflow at the edges where such airflow could strengthen the convective exchange efficiency of hot air in low altitude and cold air in high altitude, and can obtain thermal comfort and sufficient natural ventilation at the pedestrian level; (2) after a series of simulations and comparisons, the configuration in which buildings are grouped in staggered layout with a centralized green space can provide better ventilation conditions and suitable air movement as a result of attenuated revised standard effective temperature (SET). This configuration is regarded as the optimum pattern of the building and green space.

Keywords

outdoor thermal environment, natural ventilation potential (NVP), patterns of the building and green space, numerical simulation

Article History

Received: 4 July 2013

Revised: 20 November 2013

Accepted: 2 December 2013

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1 Introduction

The micro-scale climate in built-up urban areas is vital for the health and comfort of human beings (Mochida and Lun 2008). Additionally, it significantly affects the energy consumption and the natural ventilation of buildings within the area where improvements are needed in the next decade to ensure more sustainable buildings (Grimmond et al. 2010). Therefore the increasing number of people immigrating to urban areas in recent years has urged the establishment of numerous buildings and the transformation of green spaces, which gradually increased the intensity of urban heat island (UHI) in mega cities such as Beijing in China. Correspondingly, the deterioration of the micro-scale outdoor/indoor thermal environment in apartment blocks has become a serious problem. Such deterioration is notable mainly for the aggravation of outdoor thermal environment

and overlooked in buildings that do not utilize natural ventilation as a ventilation strategy (Mahdavi and Pröglhöf 2008).

Many countermeasures, including optimum arrangement of pilotis, planting, proper architectural design and environmental engineering have been proposed from different standpoints to mitigate partial heat island and to improve the micro-scale outdoor thermal environment in urban areas (Hsieh et al. 2010). Several studies have investigated green building cases to quantify outdoor thermal comfort and heat island potential change in a day according to building type, site planning type, and facade direction landscape ratio (Jeong and Yoon 2012). The ameliorating effect brought about by the arrangement of trees, particularly their shading of solar and long-wave radiation and production of latent heat, has also attracted attention (Yoshida et al. 2006). Multi-objective genetic

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Topic B4: Ventilation

ANALYSIS ON ENERGY SAVING POTENTIAL OF FCUS WITH COOLING WATER IN THE UPPER ZONE IN LARGE-SPACE BUILDINGS WITH STRATIFIED AIR-CONDITIONING SYSTEM

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Keywords: Large space, Stratified air-conditioning system, Cooling water, Free-cooling, Energy saving potential

SUMMARY

Normally, large-space buildings adopt the stratified air-conditioning system for cooling. In the upper zone it has ventilation with outdoor air or radiant ceiling system with high temperature chilled water to save energy. However, the ventilation in the upper zone is not suitable for the outdoor environment with high temperature and high humidity, radiant ceiling system in the upper zone has the potential damage of dewing. Therefore, a new method with fan coil units (FCUs) in the upper zone is proposed in this paper. The cooling water of FCUs comes from the cooling tower, which is low-grade cold energy and easy to obtain. By designing and studying twelve cases in summer air conditioning designed condition of Nanjing city in China, the energy saving potential of stratified air-conditioning system in large-space buildings with the new method is analysed. The results show that the biggest energy saving rate is about 20.84%.

INTRODUCTION

Large-space buildings such as industrial buildings, airport terminals and gymnasiums cover a wide range of size and consume a considerable amount of energy. Normally, large-space buildings adopt the stratified air-conditioning system for cooling, which only air-conditions the lower zone (occupied zone). What's more, different ways are applied to deal with the upper zone to save energy, such as ventilation with outdoor air and radiant ceiling system with high temperature chilled water (Atila and Jelena, 2001) (Riffat et al., 2004). However, for ventilation in the upper zone, when the temperature and humidity of fresh air is high enough, the exhaust air's enthalpy will be lower than the fresh air's to bring in more fresh air cooling load. For radiant ceiling system in the upper zone, it has the potential damage of dewing (Stanley, 2002).

To reduce the energy consumption effectively for cooling in large-space buildings with stratified air conditioning system, it should decrease the air temperature in the upper zone without introducing moisture to the upper zone. Supposed that a few FCUs (Fan Coil Units)

EQUIVALENT CONTAMINANT SOURCE: A NEW INDEX TO EVALUATE THE LOCAL VENTILATION PERFORMANCE

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Keywords: Ventilation, Equivalent contaminant source, Local purging flow rate, Markov process, Non-uniform indoor environment

SUMMARY

Local purging flow rate and local ventilation rate are the main evaluation indices of local ventilation. When the distribution of contaminant source in a ventilated room is non-uniform, the two indices are unable to evaluate the local ventilation performance. To evaluate the local ventilation performance efficiently, equivalent contaminant source, a new index that is based on the Markov process of indoor airflow is proposed in this paper. A new evaluation method on the local ventilation performance is built by combining equivalent contaminant source with local purging flow rate. Nine cases with two occupants in an office room are designed to demonstrate the new evaluation method. The result shows that the proposed method can evaluate the local ventilation performance.

INTRODUCTION

Ventilation is a usual method to maintain indoor air freshness and control the contaminant concentration. The traditional ventilation normally considers the overall rather than local effect. Therefore, indices such as nominal ventilation rate, air exchange efficiency and contaminant removal efficiency are generally used to assess the ventilation performance. However, in most cases, the airflow field formed either by natural ventilation or mechanical ventilation is non-uniform. In this case, the overall performance cannot represent the local ventilation effect. Therefore, these traditional indices are inadequate to present the indoor air distribution details and evaluate the local ventilation performance.

With the continuous awareness of non-uniform air distribution, more and more attention was paid on the local ventilation performance. Many evaluation indices were proposed to evaluate local ventilation performance. They can be divided into two categories: local ventilation rate category, such as local mean age of air (BRITISH STANDARD, 2007), local ventilation rate and local air exchange rate (Shao et al., 2011); local purging flow rate category, such as local purging flow rate (Sandberg and Sjöberg, 1983), bypass factor (ASHRAE, 1999), and net escape velocity (Lim and Ito, 2012). Local Ventilation Rate (LVR) and Local Purging Flow Rate (LPFR) are the two most typical indices among them. LVR is defined as the reciprocal of the local mean age (Shao et al., 2011), which can evaluate the local ventilation performance when the contaminant source is distributed uniformly. LPFR expresses the net



Risk assessment of population inhalation exposure to volatile organic compounds and carbonyls in urban China



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ARTICLE INFO

Article history:
Received 6 January 2014
Accepted 22 June 2014
Available online 2 August 2014

Keywords:
Air pollution
Exposure
Cancer risk
Outdoor
Indoor
Urban China

ABSTRACT

Over the past three decades, China has experienced rapid urbanization. The risks to its urban population posed by inhalation exposure to hazardous air pollutants (HAPs) have not been well characterized. Here we summarize recent measurements of 16 highly prevalent HAPs in urban China and compile their distribution inputs. Based on activity patterns of urban Chinese working adults, we derive personal exposures. Using a probabilistic risk assessment method, we determine cancer and non-cancer risks for working females and males. We also assess the uncertainty associated with risk estimates using Monte Carlo simulation, accounting for variations in HAP concentrations, cancer potency factors (CPFs) and inhalation rates. Average total lifetime cancer risks attributable to HAPs are 2.27×10^{-4} (2.27 additional cases per 10,000 people exposed) and 2.93×10^{-4} for Chinese urban working females and males, respectively. Formaldehyde, 1,4-dichlorobenzene, benzene and 1,3-butadiene are the major risk contributors yielding the highest median cancer risk estimates, $>1 \times 10^{-5}$. About 70% of the risk is due to exposures occurring in homes. Outdoor sources contribute most to the risk of benzene, ethylbenzene and carbon tetrachloride, while indoor sources dominate for all other compounds. Chronic exposure limits are not exceeded for non-carcinogenic effects, except for formaldehyde. Risks are overestimated if variation is not accounted for. Sensitivity analyses demonstrate that the major contributors to total variance are range of inhalation rates, CPFs of formaldehyde, 1,4-dichlorobenzene, benzene and 1,3-butadiene, and indoor home concentrations of formaldehyde and benzene. Despite uncertainty, risks exceeding the acceptable benchmark of 1×10^{-6} suggest actions to reduce exposures. Future efforts should be directed toward large-scale measurements of air pollutant concentrations, refinement of CPFs and investigation of population exposure parameters. The present study is a first effort to estimate carcinogenic and non-carcinogenic risks of inhalation exposure to HAPs for the large working populations of Chinese cities.

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1. Introduction

Public concern regarding organic hazardous air pollutants (HAPs) continues to grow world-wide. HAPs have a wide range of sources, effects and exposure routes. Their sources include indoor sources (Clarisse et al., 2003; Kim et al., 2001), outdoor vehicle emissions and industrial combustion (Guo et al., 2004b; Ohura et al., 2009). Their adverse health effects range from irritation of eyes, skin, mucous membranes and respiratory tract (Jones, 1999; WHO, 2010) to serious chronic illnesses such as asthma (Weisel, 2002), chronic obstructive pulmonary disease (Viegi et al., 2006), cardiovascular disease and cancer (Lewtas, 2007; WHO, 2010). Because of their relatively low boiling points and high vapor pressures, the main exposure pathway to most HAPs is through inhalation (Ramirez et al., 2012).

Due to rapid industrial and economic development over the past three decades, China has experienced large migration from rural areas to cities; urban growth and modernization; and a concomitant increase

in urban air pollution (Fang et al., 2009; Zhang et al., 2013b). From 1990 to 2010, China's urban population more than doubled; net urban residential building area grew from 4 to 21 billion m^2 ; and the number of motor vehicles increased from 5 to 78 million (NBS, 2011). By 2007, China's formaldehyde production had reached a staggering 12,000 kt, about 4000 times what it was five decades earlier. More than 65% of formaldehyde produced is used to synthesize resins used in construction materials which are therefore a source of indoor formaldehyde pollution (Tang et al., 2009).

However, qualitative and quantitative changes in population exposure to HAPs with urbanization in China have not been characterized sufficiently, nor have the health risks of these HAP exposures. The few studies that have assessed health risks posed by HAPs in China have been limited to either indoor or outdoor exposure, or to a small number of carcinogenic HAPs, or to localized cases within small sample sizes. Zhou et al. (2011) monitored personal exposure to volatile organic compounds (VOCs) and estimated associated cancer risks (median, 4.4×10^{-5} , which means 4.4 additional cases per 100,000 people exposed) in Tianjin. However, their results were limited because formaldehyde and acetaldehyde were not considered and data was only

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2013 ISES Solar World Congress

The Energy-related Impacts of Social Factors of Rural Houses in Southwest China

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Abstract

Background: In the last 30 years, the average energy consumption of one person has risen from 80 kgce to 204 kgce in Chinese rural areas. Considering rural areas in China occupy over a half of China's population, the study on energy usage of rural houses is crucial to the development of building energy efficiency of China. Researchers have conducted many studies on this situation, and the climate and technology are mainly considered in these studies. However, in recent years, great changes have taken place in terms of social factors of rural areas in China, for example, rural migration to the cities and gender imbalance. Some changes may lead the rural occupants to a high-carbon life-style.

Objectives: This research exploits the data collected from rural houses in southwest China and aims to establish which factors relate to occupant social aspects, and to what extent affects energy-related characteristics in rural houses. We hypothesize, in rural houses, that the energy efficient design strategies are not only related to climatic and building envelope physical characteristics but also may be derived with the particular considerations on social factors.

Methods: 50 houses in Tongzi rural area of Chongqing city were selected as the samples. In this paper, the social factors lie in three folds in this research, occupants' demographics, life patterns, and behaviors. The energy-related characteristics embrace three aspects: thermal comfort, predicted energy consumption, and heating methods. Measurements on energy usage and environmental performance were conducted for each house. Also, we used semi-structured interviews on social factors for each family. The process of life patterns was observed by the researchers. In addition, statistics from the local government were used. The variables in this research are investigated by linear regression, one-way ANOVA, and contingency analysis.

Results: This study shows the female group preferred to warmer thermal conditions and spent 33% more hours in kitchens which consume over 50% total building energy in rural houses. The group with more hours per day spent outside reported the lower level at the indoor operative temperature, compared with the group with more indoor hours (*P*-value is 0.042). In addition, two basic heating choices in winter were adopted by rural occupants: charcoal braziers (28.6%) and indoor sun exposure (71.4%). Also, the use of charcoal braziers compromised with aging.

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Design Strategies on Heat Recovery of Cooking Stove in Rural Houses of China

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ABSTRACT

Wulong County is a high altitude mountainous region located in the southeast of Chongqing Province, included in the hot summer and cold winter (HSCW) climate zone of China. The indoor and outdoor temperatures are quite low during the winter and sometimes are intolerant for local occupants. The percentage of possible sunshine is only 13% in winter according to meteorological data, which makes it nearly impossible to use solar energy for space heating. Other ways of heat gaining without extra energy consumption should be explored for the rural houses of this area. This paper analyzed impacts of cooking activities on indoor environmental quality, and estimated the potential of heat recovery of cooking stove for space heating. We conducted in-depth observations of occupants' behavior (including life patterns and cooking activities) and field investigations on thermal environment and indoor air quality. A series of design strategies were proposed based on these survey results. The strategies emphasized the utilization of heated walls and a proper room layout.

INTRODUCTION

The hot summer and cold winter (HSCW) climate zone, with 0.55 billion people living there, covers a grand area of the central China. The climate is far harsher than any other places of the same latitude. Wulong County located in Chongqing Province with an average altitude of over 1,000 meters above sea level, is a representative area of the HSCW zone. The annual average temperature is 15-18°C. The extreme minimum temperature can reach as low as -3.5°C, while the highest temperature is 41.7°C, with high humidity all year round. The annual precipitation is 1000-1200mm. Most precipitation is April to June for four months, accounting for 39% of annual precipitation. People live in this remote mountainous area suffer from both extreme hot summer and cold, wet winter. The present existing rural houses fail to achieve thermal comfort especially in winter. According to the field measurements performed in February, 2012, the average indoor air temperature of a traditional timberwork house is 2.45°C. The indoor temperature even falls below zero sometimes. The situation with the modern concrete house is no better. The average indoor air temperature is 4.59°C with the minimum value of 1.4°C, which are far below the thermal comfort zone. The heating season is up to six months from October to the following March.

Thermographic Study on Thermal Performance of Rural Houses in Southwest China

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ABSTRACT

The thermal performance assessments of rural houses are often inaccurate by thermal calculation or simulation due to complicated micro climates of rural settlements and the informal processes of self-built structures. Infrared (IR) thermography is an effective and efficient tool to evaluate building and material performance. This study aims to show the possibilities of using IR imaging to better understand the thermal process of rural houses. Several typical rural houses with different kinds of building envelopes in the Southwest of China were selected. A series of thermographs were taken under various circumstances, including different seasons, time periods and weather conditions. Continuous outdoor and indoor air temperature measurements were conducted simultaneously. The results show that the correlation between envelope surface temperature distributions and air temperature variations of adjoining rooms, as well as the heat gaining and losing processes of different building envelopes.

INTRODUCTION

The study on the thermal environment of rural houses is of great significance. On the one hand the rural structures are often well-acclimated with low energy consumption. On the other hand they may still need improvements to meet higher thermal comfort requirements. However, the thermal performance assessments of rural houses by using regular thermal calculation or simulation tools are often inaccurate. Because the microclimates of rural settlements are often complicated and the informal processes of these self-built structures cannot ensure the fully use of material properties. Furthermore, most rural houses are free running which means natural ventilation is enhanced. Especially in the southwest of China, the locals like having doors and windows open all day long even during the cold winter due to their living habits. Therefore, the simulation results which based on an enclosed-space model and laboratory parameters have low reliability.

Infrared (IR) thermography is an efficient tool to obtain the superficial temperature distribution of the inspected object. It has a broad range of applicability and has been applied to buildings for a couple of decades [1]. IR inspections of building envelopes can be used to detect heat losses, insulation defect, thermal bridges, air leakage and moisture sources, HVAC and electrical installations can also be

Field Study on Indoor Thermal and Luminous Environment in Winter of Vernacular Houses in Northern Hebei Province of China

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Abstract: In this paper, a climate-adaptation study of vernacular houses in northern Hebei Province has been conducted based on quantitative field surveys. Three typical vernacular houses with different kinds of building envelopes were selected. The field surveys included investigation on building material and construction, measurement of indoor thermal environment, infrared thermographic study of building envelopes and measurement of luminous environment. The results showed that the indoor air temperatures were below thermal comfort zone from late night till early morning and the horizontal temperature gradient was obvious. The adobe wall showed better thermal performance than the other two. As for the building layout, it is beneficial to put a storeroom on the north side of the house as a temperature buffer zone. Furthermore, due to missing insulation and the informal process of construction, significant amounts of heat escaped from building envelopes, especially from the corner of wall, ceiling and around the openings. The daylight factors on the work plan in the main rooms were accordance with design standards and the level of illuminance met the requirements of family's daily activities.

Keywords: thermal environment; luminous environment; vernacular houses; sever cold zone

CLC number: U463.5 **Document code:** A **Article ID:** 1005-9113 (2014) 04-0077-07

1 Introduction

Kangbao County is located at the northwest corner of Hebei Province, China, with an average elevation of 1450 meters. It is part of the southern end of the Inner Mongolia Plateau and belongs to the Sever cold climate zone. The average annual temperature is 1.2 °C with rain and heat over the same period. The courtyard houses in this area typically stand for dwelling houses in the plain of North China. The main house is south or southeast oriented with 3–5 rooms. Due to the impact of historical immigration movement from Shanxi Province, the houses in this area have the characteristics of the traditional vernacular dwelling situated in Northern Shanxi.

In this paper, a climate-adaptation study of vernacular houses in Kangbao County has been conducted. The research group carried out the field investigation and measurements from February 19th to February 27th, 2012. Three typical vernacular houses with different kinds of building envelopes were selected. The construction information including building material and energy consumption was collected by questionnaire interviews. The measurement of indoor thermal environment, infrared thermographic study of

building envelopes and measurement of luminous environment were also included.

2 Methods

2.1 Assessed Buildings

The earliest existing houses of the village were built in the 1960s. These houses were made of adobe brick with the dimension of 400 mm × 200 mm × 70 mm. The surfaces of walls and roofs were accomplished with mud and straw, leading to rain erosion problems during the rainy season. It requires a lot of labor to build and needs high maintenance to build an adobe house. Along with the export of rural labor from 1980s, the adobe bricks were gradually replaced by clay bricks. And after the 1990s, the adobe bricks were no longer in use.

Three representative houses were chosen for this study, as shown in Fig. 1. House A was an adobe house built in the 1970 s. The thickness of the north wall is 800 mm and all the other exterior and interior walls are 400 mm thick. No thermal insulation layer was installed for walls and roofs. The house has four rooms. The eastern bedroom has double-window with aluminum alloy frame while the other rooms use monolayer windows with wood frames.

Received 2014-06-06.

Sponsored by the National Natural Science Foundation of China (Grant No. 51278262) and State Key Laboratory of Subtropical Building Science (Grant No. 20111450987).

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Fieldwork Test Research of the Impact on Building Physical Environment on Six Types of Atrium Space in Cold Climates

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Abstract: Since the research on verification to passive design strategies in sustainable building is at the initial stage, and its test method and verification conclusion are not scientific enough to validate, this paper proposes the necessity of building physical environmental monitoring to quantitative optimization of passive strategies efficiency from the perspective of architecture design and building environment. Adopting comparative research method, this research chooses six types of atrium space in cold climate in China as a prototype, focusing on building physical environmental performance difference in and between atrium and building main space. Spatial parameters of the atrium space will be divided into four factors: spatial geometry, interfacial properties, internal and external related categories. With subdividing these four factors into sub-factors, this paper makes cross-comparison among the sub-factors to clarify passive strategies effectiveness in atrium. Data comparison analysis shows that Winter atrium passive strategy in cold regions from traditional view is not obvious in practical application, and test data need to be stratified refined in atrium design in case of optimizing passive strategy from building prototype perspective.

Keywords: atrium space; building physical environment; fieldwork test; space effect

CLC number: TU24/TU11 **Document code:** A **Article ID:** 1005-9113 (2014)04-0084-07

1 Introduction

The research on verification to passive design strategies in sustainable building is at the initial stage, and its test method and verification conclusion are not scientific enough to validate. Since the lack of actual verification data support, architects' means and methods to select passive strategies in architecture design phrase are still based on subjective judgment or computer simulation^[1]. Without long term and real testing data to be confirmed or falsified, the effectiveness of the passive strategies may not be easy to optimize them further on^[2]. On this account, this paper proposes the necessity of building physical environmental monitoring to quantitative optimization of passive strategies efficiency from the perspective of architecture design prototype. How to determine a passive strategy work is a complex process, which may be influenced and restricted by many factors, and need to be verified through practice experience and long-term monitoring verification^[3-4].

2 Field Survey

The field survey selects the most typical passive

design strategy—atrium space which has the function of modulate in architecture design phrase. The atrium space is usually considered to organize the function and streamline all space reasonably, and promote building nature lighting and ventilation ability by improving the communication between building and nature, and optimize indoor environment quality by inserting green and courtyard space^[5-6]. The field surveys were conducted in 4 buildings in Xi'an and Beijing city within cold climate zone of China, including six different types of atrium space. The building names and codes are as follows respectively (Fig. 1): Xi'an ChanBa Business Center (Building code: B1, B3), Shaanxi Library (Building code: B2), Xi'an Jiaotong University Teaching Administrative Building (Building code: B4), Architecture Design and Research Institute of Tsinghua University (Building code: B5, B6).

Field survey period started from 30th December 2013 to 15th February 2014, lasting two and half months. In order to research interior thermal comfort and indoor air quality (IAQ) during Winter period, the monitor items included environment temperature, humidity, wind velocity and CO₂ concentration in and between atrium and surrounding main space. The instruments of field survey were including 13 sets of

Received 2014-03-01.

Sponsored by the Key Project of National Natural Science Foundation of China (Grant No. 51138004) and the National Science and Technology Support Program (Grant No. 2012BAJ10B02).

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WRF Environment Assessment in Guangzhou City with an Extracted Land-use Map from the Remote Sensing Data in 2000 as an Example

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Abstract: Mesoscale urban environment forecast combined with WRF is a current frontier in international academic. Taking Guangzhou as an example, the new land-use model presented by the present authors, the existing USGS and MODIS models in WRF were firstly compared to the remote sensing model in this article. The comparison result shows that the land-use model presented by the authors has the highest similarity with the remote sensing data. Secondly, the new land-use model was used to replace the defaulted land-use data in WRF for simulation. By comparing this simulation results with the WRF results using the defaulted USGS and MODIS model, it was showed that the geographic models have a great impact on the mesoscale environment forecast result. Also, the geographic information model presented in this article shows the best accuracy when comparing with the observation data. Results in this study are going to be an important reference in the contemporary international forefront of mesoscale urban environment studies by WRF.

Keywords: mesoscale environmental assessment; WRF model; remote sensing

CLC number: TU1

Document code: A

Article ID: 1005-9113 (2014) 05-0026-07

1 Introduction

1.1 Background

Topic on land-use and associated changes in urban environment has been a core study globally. China has been undergoing a period of economic reform and expansion since the late 1970 s, accompanied by rapid and widespread urbanization and a deterioration of urban environment caused by the urban heat island (UHI). In recent years, for the urban scale level, with the development of CFD in mesoscale as well as the atmospheric models, for example, the mesoscale forecasting calculation methods such as the Weather Research Forecasting (WRF) [1] and the fifth-generation Pennsylvania State University-National Center for Atmospheric Research Mesoscale Model (MM5) [2], it has become easier to understand the relationship between the distribution of urban land and the UHI. This is leading an explosion of researches on the urban environment in mesoscale.

This study is operated in Guangzhou, which is located in south China. It is the capital and largest city of Guangdong province and the 3rd largest Chinese city as the city owned a population of 12.78 million of the 2010 census [3]. Located in the south-eastal portion of Guangdong, Guangzhou spans from 112° 57' to 114° 03' E

longitude and 22° 26' to 23° 56' N latitude. The city is part of the Pearl River Delta and the city center is situated next to the Baiyun Mountain.

Located just south of the Tropic of Cancer, Guangzhou has a humid subtropical climate which is influenced by the East Asian monsoon. Summers are wet with high temperatures, high humidity and a high heat index. The hottest period in the Summer usually lasts from Jul. 11th to Aug. 20th, whose average period is 41 days [4]. On the other hand, city area in Guangzhou is also expanding at a very high speed. From the statistical data on China City Statistical Yearbook, we can realize that the constructed area in Guangzhou city has increased more than 4 times since the year 2000 (Fig. 1), which is much faster than the average expansion pace in the whole China.

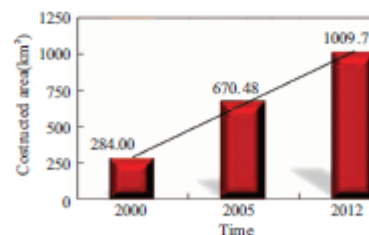


Fig. 1 Change of constructed land area in Guangzhou

Received 2014-03-01.

Sponsored by the Key Project of National Natural Science Foundation of China (Grant No. 51138004), the National Natural Science Foundation of China (Grant No. 51278262).

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Research on Two Types of Buffer Zone Impact on Surrounding Office Space Environment in Winter in Cold Climate Zone—a Fieldwork in Architectural Design Institute Building of Tsinghua University, Beijing

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Abstract: Building buffer zone space is not only one of essential approaches for better mental quality of interior building space, but also an important factor that may influence interior thermal comfort and energy consumption. This study aims to analyze regulative advantages of buffer zone to the surrounding functional spaces. Based on a fieldwork test in a typical office building in cold climate zone in Beijing, China, the monitor data show interior physical performance in the Winter. The research selects two types of different buffer zones in the same building. One is a south-faced greenhouse which has large dimension with plenty of vegetation, and the other is a simple atrium in the middle of five floor building with mount of skylights. The factors and their influence to surrounding functional spaces and the whole building are found out from the comparisons of collected data by floor to floor monitor test on both buffer zones at the same time. The comparisons of two types of buffer zones conclude that the greenhouse is more effective to air quality regulation but not so clearly well-performed to thermal buffering as expected due to the dominate active central heating in the Winter. This fieldwork test results for building performance can be helpful for both architects and engineers in the early phase of sustainable design.

Keywords: public building; buffer zone; building performance; fieldwork test; space effect

CLC number: TU24, TU11 **Document code:** A **Article ID:** 1005-9113 (2014) 05-0033-07

1 Introduction

Atrium and greenhouse are usually considered as an important role to regulate the mental quality of architectural spaces. They can arrange relative functional spaces, provide natural ventilation and lighting, embody courtyard with greening in the building and thus make architectural form optimized^[1-3]. These atrium and greenhouse introduce natural environmental factors into the artificial spaces, and avoid the future operating contradiction in the earlier prototype design phase^[4-6]. For the Greenhouse Effect in cold climate zone, these spaces are expected to weaken the impact of outside cold air or temperature and thus called Buffer Zone^[7-9]. However, these advantages of the regulation to the whole or some parts of built environment, are the simple judgment a priori in design phase, and need to verify from the fieldwork test of the building performance in the operation phase^[10-11]. This study aims to verify the space effect from the buffer zones to the inner neighboring spaces, through on-site testing of built physical environment of a typical office building in

Beijing, Architectural Design Institute building of Tsinghua University. There are two types of buffer zones in the building: one is a south-faced greenhouse which has large dimension with plenty of vegetation, and the other is a simple atrium in the middle of five floor building with mount of skylights.

2 Architectural Spaces and the Strategy of Buffer Zones

Architectural design institute building of Tsinghua University was designed in 1997 and built in 2000. This building has a rectangular floor plan, RC framed structure and five floors with altogether 8500 m² area^[12]. In the design phase, it was developed through the sustainable strategy by means of enclosure insulation, shading, greenhouse and solar energy, and offered the efficient workplace and healthy environment for the people^[13].

The south-faced greenhouse is 3-floor high (as shown in Fig.1), offering a vibrant inside landscape for a break as well as reducing the impact from outside to inner functional spaces^[14]. As expected of architectural

Received 2014-03-01.

Sponsored by the Key Project of National Natural Science Foundation of China (Grant No. 51138004), and the National Science and Technology Support Program (Grant No. 2012BAJ10102).

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宋晔皓 孙菁芬 SONG Yehao, SUN Jingfen

建筑学语境下的可持续设计

解读北京动物园水禽馆

Towards a Net Zero Energy Building

Collaboration-based Sustainable Design and Practice in the Waterfowl Pavilion, Beijing

DOI:10.13717/j.cnki.ta.2014.05.015

摘要 北京动物园水禽馆是一个以“零能耗”为目标的微能耗建筑。设计采用整合设计的思路,从“城市—建筑—细胞”各个层面进行了深入的研究。项目的最大特点是对可持续发展的建筑学思考,其整体布局、建筑平面组织、剖面组织等方面均从建筑学角度出发,提出合适的解决方案。形式本身是创造性解决可持续设计需求的重要手段。

关键词 微能耗建筑;整合设计;形式;可持续设计

ABSTRACT Waterfowl Pavilion in the Beijing Zoo is designed to be a net zero energy building, aiming for zero energy and zero carbon emission. The designers

adopted an integrated design method in the design process, and exploited from three different layers, namely the urban context, architecture and detailing. And the creation of forms has been combined with demands of sustainable design.

KEY WORDS Net-zero Energy Building; Integrated Design Method; Form; Sustainable Design

中图分类号: TU-86/21; TU242.6

文献标识码: B

文章编号: 1005-684X(2014)05-0092-08



“模块美学”

——光州集装箱艺术馆设计解析*

Module Aesthetics: Analysis of the GwangJu Shipping Container Art Center

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李 欣 湖南大学建筑学院

摘 要 随着时代和科技的进步,建筑越来越倾向于绿色、低碳设计。利用集装箱单元腔体进行模块化设计,成为绿色设计手法中最新潮的部分。光州集装箱艺术馆作为二手集装箱模块化设计手法的典范作品,以其模块美学的空间构成与低碳友好的建设模式,塑造了和谐的艺术空间场所。对光州集装箱艺术馆进行设计解析,旨在探索其建筑带来的模块化低碳设计启示。

关键词 绿色设计 光州艺术馆 二手集装箱 模块化

1 绿色设计新风潮——集装箱建筑模块化设计的兴起

随着全球化气候变暖,低碳建筑逐渐出现在公众视野,无论是利用新能源还是新材料,都为应对危机提供了新思路,通过挖掘以集装箱容器作为建筑空间单元进行集装箱建筑设计研究是近年来逐渐兴起的新风潮。二手集装箱运用到建筑设计当中完全符合绿色设计的核心“3R”标准,即 Reduce、Recycle、Reuse。集装箱是模块化、标准化的产品,其内部空间可作为建筑空间单元使用,其材料具备重复循环使用的特性,安装、拆卸、施工也非常便捷,能够有效节省能耗,符合绿色设计的相关标准,也是当前最经济、最容易实施的绿色建筑实践案例。正是基于此特性,越来越多的城市中出现了用集装箱模块化设计手法设计的建筑,如集装箱住宅、集装箱旅馆、集装箱商店等。

中国工程建设协会《标准集装箱模块化组合房屋技术规程》(CECS 334-2013)中对于集装箱建筑模块化设计解释为以通用性的集装箱为载体,设计特定功能的子模块,再经过组合、添加和系统化,可以组合出多种不同功能或相同功能、不同性能的一系列组合房屋产品。这种设计方法可以推动定型设计、产品系列化和高度预制化,快速应对市场需要;另一方面房屋产品可以方便地重用、维修、拆卸和回收,是一种绿色设计方法。

2 集装箱建筑模块设计美学典范——光州集装箱艺术馆的出现

2009年,柏林 PLATOON 文化发展工作组在韩国光州利用集装箱模块化设计手法建设了光州艺术馆,这是他们在韩建设的第二个项目。随着第一个项目首尔艺术馆的成功,艺术馆将混合着韩国、亚洲和世界风格的文化表演带到了光州这个城市,在这里艺术家可以与参观者会面、交流,创造并体验着当代社会的新文化策略。光州艺术馆除设计艺术展览、音乐会、舞蹈和其他艺术表演外,还设有电影之夜、演讲、论坛、头脑风暴交流、时装表演和跳蚤市场等活动。

光州艺术馆中,层叠布置的集装箱模块塑造了开敞的展示空间,集装箱本身的形态使得整座建筑极具模块美学的特质,同时又充满了工业艺术的味道(图1)。建筑模块组合构成的概念和程序吸引了艺



图1 光州集装箱艺术馆区位图



图2 光州集装箱艺术馆自然纯朴的建筑外观



图3 建筑由集装箱墙体堆叠围合而成

城市空间扩张与机动化水平增长之间的 互动关系探析

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摘要: 城市空间扩张与交通机动化水平增长之间关系密切。为探讨改革开放后我国城市空间扩张与机动化水平增长之间的互动关系,考察两者之间相互的影响程度及互动均衡特征,本文采用计量分析方法对1985-2010年的数据进行分析。研究结果表明:①改革开放至今,中国城市空间扩张与机动化水平增长之间存在长期稳定的互动均衡关系;②机动化水平增长对城市空间扩张的影响存在一定的滞后性,初期中国城市空间扩张主要受自身波动的影响,机动化水平的增长对其影响较小,在远期两者之间相互影响趋于稳定平衡。该分析结果有利于深化认识现阶段我国城市空间不断扩展现象及其空间扩张同机动化水平之间的关系,以应对现阶段我国城市交通问题。

关键词: 城市交通;互动关系;计量方法;城市空间扩张;机动化

Interactive Relationship between Urban Spatial Expansion and Mobility Growth in China

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Abstract: There is a close relationship between urban spatial expansion and mobility growth. To investigate the degree of mutual influences and characteristics of interactive equilibrium between them since the reform and opening in China, this paper uses the econometric methods based on the data of urban spatial expansion and mobility growth during the period 1985-2010. The empirical results show that there is a long-term stable interactive equilibrium relationship between urban spatial expansion and mobility growth. The study finds that the mobility growth exerts a hysteretic impact on the urban spatial expansion. The dominant factor influencing the urban spatial expansion is from its own and the impact of mobility growth on urban spatial expansion is little in early years. However, the mutual impacts between them reach a stable equilibrium in the long-term. It is helpful to recognize the relationship between urban spatial expansion and mobility growth in China, so that some measures can be taken to response to the urban expansion problems.

Key words: urban traffic; interactive relationship; quantitative methods; urban spatial expansion; mobility

收稿日期:2013-10-15

修回日期:2014-01-05

录用日期:2014-01-23

基金项目:国家自然科学基金面上项目(41371169);广东省自然科学基金(S2012040007176);深圳市科技研发基础研究项目(JCYJ20120615145601342);生态规划与绿色建筑教育部实验室(清华大学)专项经费资助(2013U-6)。

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长沙城区工业建筑保护与更新后的可持续探讨

A Discussion of the Sustainable Preservation and Regeneration of Industrial Buildings in Changsha

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收稿日期

2013/12/12

生态规划与绿色建筑教育部重点实验室开放基金
(2013B-7)

摘要

选取长沙市区 3 种地段保护与更新的实践案例进行调研分析, 通过其改造后运营状况展开调研和评价的对比分析, 探讨在城市化进程中复杂的城市条件和不同资本引导下长沙工业遗产再生后的价值再利用。

关键词

长沙工业建筑; 保护与更新; 可持续再利用

ABSTRACT

Through fieldwork and analysis of industrial buildings in 3 types of locations in Changsha, this paper compares among them operation and evaluation after regeneration, and discusses complex urban situations in urbanization and the ways of reusing industrial buildings financed by different parties.

KEY WORDS

industrial buildings in Changsha; preservation and regeneration; sustainable reuse

1 研究背景

近年来城市土地资源日益紧张, 随着城市土地资源供应日益紧张, 城市废旧厂房更新在所难免。工业建筑不再是遭到城市发展遗弃的边缘地区, 而是因其优越的地段呈现出特有的土地价值, 成为各大地产商和各级政府眼中的稀缺资源。在过去, 工业厂房往往遭遇粗暴的拆除, 更新为新的商业地产项目。随着城市化步伐的加快, 工业遗产在拆与保、遗弃与利用之间始终存在着激烈的碰撞。有的缺乏对工业遗产的整体评价; 有的至今尚未被纳入文化遗产保护的范畴, 有的甚至不知道宝藏就在身边^[1]。2006年4月, 无锡举行的中国工业建筑遗产保护论坛上首次提出将工业遗产作为我国文化遗产来保护, 著名的《无锡建议》^[2]拉开了工业遗产保护工作的序幕。如今在工业厂房的更新案例中, “片段性保护”已成为工业建筑保护的常态。一方面, 当下某种程度上的文化回归使得开发商看到了“创意产业”符号下的潜在高回报商机; 另一方面, 地方政府为了提高城市品位和新的活力, 已不满足于单纯靠经济实力的提高来彰显政绩, 更开始关注城市多元文化的塑造, 各城市之间甚至也在开始慢慢打“文化牌”, 展开“新资源”的挖掘, 而城市中的工业建筑无疑

是可打造为城市名片的另一种方式。

纵观国内外工业建筑保护与更新案例, 从保护程度上来看大致可分为 3 种类型: 整体保护、选择性改造更新和单体式保护的工业建筑。而从改造细节上又可以分为 4 类: 1) 功能置换: 由于建筑逐渐失去自身的功能, 改造后必须设置一些新的场景和功能, 使其重生; 2) 旧旧弥合: 通过以新设计的灰空间链接老建筑, 使其新旧融合, 组织成一个统一的群落; 3) 以旧纳新: 在老建筑内添加新结构, 从而获得更为丰富的空间, 以适应新的功能; 4) 表皮整饬: 对于立面毁损严重或历史、审美价值不大的老建筑, 可保留老建筑骨架以最大程度地延续历史信息, 同时赋予新的表皮^[3]。无论哪种类型, 工业建筑遗产保护都有其存在的合理性和必要性, 是对城市的工业化历史文脉的重视和回归, 值得鼓励。本土地方文化是城镇最普遍的特征, 例如德国鲁尔工业区, 其工业遗产保护的特点就是由原来的资源型城市转型成文化型城市的经典案例, 而我国城市工业建筑保护也不应例外。北京 798、上海红坊创意园区、上海沙泾路 1933 老场坊等成功的改造案例之后, 城市中工业建筑在商业和文化宣传上的价值直观地凸显出来。这让各地方政府尝到了名利双收效应, 各地工业

绿色住宅的智能化控制技术研究

——以 SDC2013 参赛作品为例*

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摘要: 2013 年中国山西大同举办了第七届国际太阳能十项全能竞赛暨第一届中国国际太阳能十项全能竞赛。相比于往届竞赛,本次竞赛中参赛作品在智能化设计上有更大的提升。东南大学参赛队参赛作品“阳光舟”(SOLARK)兼顾了传统与现代的建筑元素,外型虽采用传统坡屋顶造型,但内部设备以及太阳能系统均实现了智能化控制,真正地实现了智能、低能耗、绿色。本文针对阳光舟的建筑设计特点、设备系统以及智能化控制系统进行介绍,并对其智能化控制系统的详细配置与布局进行解析,以期对未来智能化绿色住宅的进一步发展提供一些思路和经验。

关键词: 绿色住宅; 智能化控制; SDC2013

0 前言

2013 年 7 月,第七届国际太阳能十项全能竞赛暨第一届中国国际太阳能十项全能竞赛(Solar Decathlon China, SDC)(亚洲赛区)在中国山西大同举办。此次竞赛是 SD 竞赛在中国也是在亚洲的第一次举办,共有来自全球六大洲 13 个国家 35 所不同大学组成 22 个参赛队参赛。与往届比赛规则相同,各参赛队必须在十五天的时间内完成房屋建造,在建筑设计、工程技术、太阳能利用、舒适程度、能耗平衡、市场推广等十个评分项进行比赛。相比于往届比赛,SDC2013 的参赛作品在整体的智能化控制系统上有了更大的提升。智能化控制系统已经基本可以覆盖住宅内部所有电器并与电网、太阳能系统连接。SDC 竞赛的小住宅实验为智能化的工业化住宅提供了巨大的研究平台,对住宅智能化乃至整个住宅产业化^[1]的发展都有着重要意义。本文以 SDC2013 参赛作品“阳光舟”(SOLARK)为例,在对其建筑设计,设备系统介绍的基础上,对其智能化控制系统以及详细的设备配置以及功能进行分析,来探讨未来智能化工业住宅^[2]发展的特点与趋势。

*基金项目:生态规划与绿色建筑教育部重点实验室开放课题(2013B78861121)

1

城市边缘区空间发展探讨 ——以北京市海淀区为例

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摘要:在快速城镇化时期,城市边缘区是城市扩张过程中空间结构变化最大、土地利用转变最快的地区,以过渡性、复杂性、动态性为突出特征。研究城市边缘区的空间演变对认识城镇化、优化城市空间结构等具有重要意义。本文在总结海淀区空间发展历史渊源的基础上,采用了RS/GIS技术对20世纪80年代以来海淀城市边缘区的范围、空间扩张进行了定量分析;并结合系统论方法,探索影响海淀城市边缘区空间演变的若干因素。研究发现:海淀城市边缘区空间发展有独特的地理优势和文化渊源,且在政策、经济、人口、交通等因素的综合作用下,处于不断动态变化之中;呈现出沿环线不规则分布、边界由清晰变模糊、整体向西北推移的空间特征;总面积逐渐增加、年扩张速率先升后降;1995-2007年以向外扩张为主,其他阶段以内部填充型发展为主;空间分布及扩张强度在不同乡镇街道具有区域差异性。本文将RS/GIS技术与系统分析相结合,来研究城市边缘区相关问题的技术可行性。

关键词:城市边缘区;空间发展;海淀区;RS;GIS技术

DOI: 10.3724/SP.J.1047.2014.00214

随着城市经济发展和空间扩张,城市边缘区作为城市、乡村环境空间的过渡地带,其功能已逐步独立与完善,并演化为城市空间扩张过程中最敏感、变化最迅速的地域实体。从西方发达国家城市空间结构演化过程来看,城市边缘区已经成为未来城市发展的关键地带。海淀区作为北京上风上水的城市边缘区,其发展一直备受关注。本文通过RS、GIS方法客观反映海淀城市边缘区的动态变

化,对其时空演变及影响因素进行一定的探索。

1 数据来源及研究方法

1.1 数据来源

本研究采用的数据包括5期TM遥感影像(分辨率30m),以及北京行政区域界线基础地理底图(1:90 000)、北京市海淀区行政区划图,如表1所示。

表1 研究中使用的数据

Tab.1 Data used in this study

| | 遥感平台及传感器 | 获取时间 | 资料来源 |
|------|--------------------|------------|--|
| 影像数据 | Landsat5 TM | 1988/12/25 | 中国科学院数据应用环境网站 http://www.csdn.cn/ |
| | | 1995/04/09 | |
| | | 2007/05/28 | |
| | | 2009/07/20 | |
| | | 2010/06/05 | |
| 行政区划 | 1:9万北京行政区域界线基础地理底图 | | 北京市规划委员会 |
| | 北京市海淀区行政区划图 | | 海淀区民政信息网 http://mzj.bjhd.gov.cn/xzqb/ |

1.2 研究方法

国内外对城市边缘区范围的划分方法有:(1)定性划分方法,如C.R.Bryant等^[4]认为城市边缘区

是城市外围9.65~16.09km的区域;J.Freidman等^[5]根据人们的日常通勤范围,将城市周围约50km的区域划分为城市边缘区。(2)定量划分方法,如

收稿日期:2013-05-28; 修回日期:2013-07-05。

基金项目:国家自然科学基金项目(51078213)。

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国外集装箱住区的规划设计启示

王蔚 邵磊 欧雄全 李欣

摘要 目前我国的大多数城市外来人员属于低收入阶层，且这种住戶的数量还在逐年大量增加。由于缺少廉价的临时性住房，从而导致外来人员中的低收入个人住戶居住生活水平偏低。本文从可持续发展的角度出发，来寻找和借鉴国内的一些优秀策略进行研究。选取二手集装箱的再利用的五个社区场所案例进行研究分析，充分挖掘出一些有价值的参考策略，从而为我国城市外来人员打造良好的临时性居所提供设计参考，并提出我国集装箱村的设想。

关键词 城市外来人口；集装箱建筑；可持续发展；设计参考

作者：清华大学建筑学院
法国SCAU设计公司
湖南大学建筑学院

1、背景

随着我国城市化进程的快速发展，外来务工人员的比重不断加大。根据2010年第六次人口普查，全国有流动人口（户口登记地在外乡镇街道的人口）26093.79万人，占全国总人口的19.58%，差不多每5个人中就有1个流动人口；全国人均住房建筑面积12平方米以下的有4680.99万户，占全国总户数的11.64%；在经济适用房建设上全国有56.95万户租赁廉租住房，占1.45%，但廉租房建设成本高，周期长，且灵活性差，根本满足不了这个庞大的群体。所以要想快速解决此类问题并非一时。如何把可持续发展的策略引入其中，既完成社会需要又实现可持续发展，是未来每一位建筑师需要思考的问题。随着集装箱建筑的出现这种时尚潮流开始蔓延开来：在荷兰，建筑师利用二手集装箱给学生建造一个有1000个房间的学生公寓（Keetwonen (Amsterdam student housing)），这是一个荷兰政府参与的大型项目，于2006年动工，解决了当地大学生住房难的问题。这让阿姆斯特丹成为世界上拥有最多集装箱房屋的城市。同样在我国较发达城市如上海集装箱村的雏形也逐渐形成，主要存在于城市边缘地区，以外来务工人员为主（图1），其形成的原因主要有

五个方面：（1）城市高房价和高租金；（2）以城市外来务工人员为主；（3）城市生活成本的偏高；（4）居所临时性和便捷性；（5）集装箱自身的特性。但是往往自发建设起来的集装箱村由于土地使用问题、基础设施配套等限制，这种社区存在着很多弊端，还不能算是真正意义上的社区。其原因主要可以归结为：（1）居住环境较差；（2）排污渠道不规范；（3）能源供给缺乏保障；（4）缺乏“社区式”的合理规划。如果不加以适当的引导和改善，不仅其居民的生活质量得不到保障，也会给城市带来许多消极影响，例如城市空间分异、影响城市形象以及区域治安隐患等。



图1：上海集装箱村被清理前的景象

2、集装箱住宅的特性

集装箱，通常被定义为具有一定强度、刚度和规格专供周转使用的大



2013 ISES Solar World Congress

Towards Net Zero Energy Building: Collaboration-based Sustainable Design and Practice of the Beijing Waterfowl Pavilion

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Abstract

Collaboration-based design is an essential approach for sustainable building integration which leads to higher space efficiency, construction material conservation, energy consumption reduction, building appearance improvement and so on. The integration of sustainable building calls for unified control and coordination method to lead the building to be a more holistic process. This article's objective is about the cooperation process research between people in decision, design and feedback phase from related group and department participating in the building project. This paper is trying to set up a life-circle oriented framework for net-zero building (NZEB) from decision-making, building-designing to post-occupancy evaluation as a baseline and a demonstration for future building works. Taking the newly-built public building, Waterfowl Pavilion in Beijing Zoo, Beijing, China as an example, this article illustrates how to form the collaboration-based design framework and methodology for net-zero buildings. For the reason that the Waterfowl Pavilion is not only an exhibition building for public visiting, but also a residential house for birds to hatching, breeding, living and growing that the building performance requirements are more complex than ordinary building. The sustainable strategies which match to the low-energy and low carbon emission requirements are sorted in different targets to each team member. The purpose of this study is to set up the Decision-Design-Feedback Phase Process, which is an application reference. In any design stage, the decision makers and the designers could choose, judge and evaluate how design strategy factor would fit the user satisfaction and evaluation system in the future. It is a showcase to demonstrate better collaboration-based sustainable design and practice for building integration.

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Selection and/or peer-review under responsibility of ISES.

Keywords: collaboration-based practice, work framework, net-zero energy buildings

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Trivalent chromium solubility and its influence on quantification of hexavalent chromium in ambient particulate matter using EPA method 6800

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Measurement of carcinogenic Cr(VI) in ambient PM is challenging due to potential errors associated with conversion between Cr(VI) (a carcinogen) and Cr(III) (an essential nutrient). Cr(III) conversion is a particular concern due to its >80% atomic abundance in total Cr. U.S. Environmental Protection Agency (EPA) method 6800 that uses water-soluble isotope spikes can be used to correct the interconversion. However, whether the enriched Cr(III) isotope spikes can adequately mimic the Cr(III) species originally in ambient PM is unknown. This study examined the water solubility of Cr(III) in ambient PM and discussed its influence on Cr(VI) measurement. Ambient PM₁₀ samples were collected on Teflon filters at four sites in New Jersey that may have different Cr emission sources. The samples were ultrasonically extracted with 5 mL DI-H₂O (pH 5.7) at room temperature for 40 min, and then analyzed by ion chromatography-inductively coupled plasma mass spectrometry (IC-ICPMS). Cr(III) was below detection limit (0.06 ng/m³) for all samples, suggesting water-soluble Cr(III) species, such as CrCl₃, Cr(NO₃)₃, and amorphous Cr(OH)₃, in the ambient PM were negligible. Therefore, the enriched ⁵⁰Cr(III) isotope spike (in the form of Cr(NO₃)₃) could not mimic the original ambient Cr(III). Only the conversion of ⁵³Cr(VI) (in the form of K₂CrO₄) was taken into account when correcting the interconversion. We then used NaHCO₃-pretreated MCE filters (spiked with enriched isotope species) to measure Cr(VI) in the ambient PM₁₀. The samples were ultrasonically extracted at 60 °C pH 9 solutions for 40 min followed by IC-ICPMS analysis. Due to the correction of Cr(VI) reduction, the Cr(VI) concentrations determined by EPA method 6800, 0.26 ± 0.16 (summer) and 0.16 ± 0.11 (winter) ng/m³ (n = 64), were significantly greater than those by the external standard curve, 0.21 ± 0.17 (summer) and 0.10 ± 0.07 (winter) ng/m³ (n = 56) (p < 0.01, Student's t-test). Our study revealed that appropriate application of EPA method 6800 is important because it only applies to soluble fraction of Cr species in ambient PM.

Implications: Accurate measurement of carcinogenic Cr(VI) in ambient PM is challenging due to conversion between Cr(VI) (a human carcinogen) and Cr(III) (a human essential nutrient). The conversion of Cr(III) is of particular concern due to its dominant presence in total Cr (>80%). This study examined the water solubility of Cr(III) in ambient PM that was collected at four locations in New Jersey. Then we discussed the influence of Cr(III) solubility on the application of EPA method 6800, which utilizes enriched isotope spikes to correct the interconversion. Our results suggested that appropriate application of EPA method 6800 is important because it only applies to soluble fraction of Cr species.

Introduction

Chromium (Cr) in ambient particulate matter (PM) is emitted from a variety of anthropogenic sources (Barceloux, 1999; Werner et al., 2007), including metallurgical and refractory industries, chrome plating, cement, fuel combustion, corrosion inhibition, pigments manufacture, and diesel exhaust (Barceloux, 1999; Kimbrough et al., 1999; Yoo et al., 2002; Werner et al., 2007). Chromium in nature has two major forms: hexavalent chromium (Cr(VI), a pulmonary carcinogen, including lung, nose, and nasal sinuses) and trivalent chromium (Cr(III), a human essential nutrient) (Seigneur and Constantinou,

1995; Barceloux, 1999). Exposure to Cr(VI) has been reported to be associated with an array of adverse health effects, such as nasal septum ulceration or perforation, upper airway irritation, and an increased risk of lung and nasal cancer (Kimbrough et al., 1999; Ashley et al., 2003; Hazelwood et al., 2004). Cancer risk assessments conducted in New York City, NY, and Los Angeles, CA, suggested that ambient Cr(VI) had the greatest contribution to the total risk among all heavy metals in these locations (Sax et al., 2006). Given its health hazard, it is necessary to reliably measure Cr(VI) in ambient PM.

Measurement of ambient Cr(VI) is very challenging due to potential errors caused by conversion between Cr(VI) and Cr(III)

Research Article

Modeling the Joint Choice Decisions on Urban Shopping Destination and Travel-to-Shop Mode: A Comparative Study of Different Structures

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Received 5 November 2013; Revised 10 February 2014; Accepted 12 February 2014; Published 13 March 2014

Academic Editor: Huimin Niu

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The joint choice of shopping destination and travel-to-shop mode in downtown area is described by making use of the cross-nested logit (CNL) model structure that allows for potential interalternative correlation along the both choice dimensions. Meanwhile, the traditional multinomial logit (MNL) model and nested logit (NL) model are also formulated, respectively. This study uses the data collected in the downtown areas of Maryland-Washington, D.C. region, for shopping trips, considering household, individual, land use, and travel related characteristics. The results of the model reveal the significant influencing factors on joint choice travel behavior between shopping destination and travel mode. A comparison of the different models shows that the proposed CNL model structure offers significant improvements in capturing unobserved correlations between alternatives over MNL model and NL model. Moreover, a Monte Carlo simulation for a group of scenarios assuming that there is an increase in parking fees in downtown area is undertaken to examine the impact of a change in car travel cost on the joint choice of shopping destination and travel mode switching. The results are expected to give a better understanding on the shopping travel behavior.

1. Introduction

Both of the destination choice and travel mode choice for shopping trips play important roles in travel demand analysis and transportation policy assessment. Consequently, understanding factors influencing travelers' destination and travel mode choice is necessary to examine the potential effectiveness of policy measures. Previous studies have widely focused on the destination choice [1–3] and travel mode choice [4, 5], respectively. In the past few years, research on joint choice travel behavior was focused primarily on the field of travel mode and departure time [6, 7], as well as residential location and travel mode [8, 9]. As many researchers mentioned, there is a strong relationship between shopping destination and travel mode choice, and people also often make the two decisions simultaneously [10]. Joint analysis of shopping destination and travel mode is helpful to understand the interactions between them and is necessary to assess the impact of the transport policies.

Multinomial logit (MNL) model and nested logit (NL) model based on random utility maximization have been most widely used to analyze travel behavior [11]. However, the MNL model imposes the restriction that the distribution of random error terms is independent and identical over alternatives, which leads to the independence of irrelevant alternatives (IIA) property. Therefore, unobserved similarities existing among choice alternatives in MNL model are overlooked. The most widely known relaxation of MNL model is the NL model. For the NL model, a uniform amount of correlation within a nest of alternatives is allowed, but alternatives not located in the same nest are uncorrelated [12]. For the joint choice analysis of shopping destination and travel mode, two appropriate structures based on the NL model can be described: one is used to nest by shopping destination; another is used to nest by travel mode. However, the both structures can only accommodate correlation along one of the two dimensions. In recent years, the CNL model

Joint analysis of urban shopping destination and travel mode choice accounting for potential spatial correlation between alternatives

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Abstract: In recent years, there have been important developments in the joint analysis of the travel behavior based on discrete choice models as well as in the formulation of increasingly flexible closed-form models belonging to the generalized extreme value class. The objective of this work is to describe the simultaneous choice of shopping destination and travel-to-shop mode in downtown area by making use of the cross-nested logit (CNL) structure that allows for potential spatial correlation. The analysis uses data collected in the downtown areas of Maryland-Washington, D.C. region for shopping trips, considering household, individual, land use, and travel-related characteristics. The estimation results show that the dissimilarity parameter in the CNL model is 0.37 and significant at the 95% level, indicating that the alternatives have high spatial correlation for the short shopping distance. The results of analysis reveal detailed significant influences on travel behavior of joint choice shopping destination and travel mode. Moreover, a Monte Carlo simulation for a group of scenarios arising from transportation policies and parking fees in downtown area, was undertaken to examine the impact of a change in car travel cost on the shopping destination and travel mode switching. These findings have important implications for transportation demand management and urban planning.

Key words: shopping destination; travel mode choice; joint choice; cross-nested logit; Monte Carlo simulation

1 Introduction

Destination choice and travel mode choice for shopping trips both play important roles in the travel demand analysis and transportation policy assessment. Consequently, understanding the factors influencing the travelers' destination and travel mode choice is necessary to examine the potential effectiveness of policy measures. Previous studies have widely focused on the destination choice [1–3] and travel mode choice [4–5], respectively. In the past few years, the research on the joint choice travel behavior was focused primarily on the field of travel mode and departure time [6–7], residential location and travel mode [8–9]. There is a strong relationship between shopping destination and travel mode choices, and people often make the two choices simultaneously [10]. Joint analysis of shopping destination and travel mode is helpful to understanding the interactions between them, and necessary to assess

the impact of the transport policies.

Multinomial logit (MNL) model and nested logit (NL) model based on the random utility maximization have been used most widely [11–12]. However, the MNL model cannot account for unobserved similarities which exist among choice alternatives. In the NL model, a uniform amount of correlation within a nest of alternatives is allowed, but alternatives not located in the same nest are uncorrelated [13]. In the past few years, many discrete choice models were developed based on the generalized extreme value (GEV) theory proposed by McFADDEN [14]. The GEV models are able to capture the unobserved similarities among alternatives, thus relaxing the restriction of MNL and NL model [15]. Several specific GEV models have been formulated by WEN and KOPPELAM [16] and by DALY and BIERLAIRE [17] and applied to the field of spatial analysis such as the residential location choice [2, 8, 18]. Therefore, one of the motivations in this work lies in presenting a CNL model structure based on the GEV

Foundation item: Projects(JCYJ20120615145601342, JCYJ20130325151523015) supported by Shenzhen Science and Technology Development Funding-Fundamental Research Plan, China; Project(2013U-6) supported by Key Laboratory of Eco Planning & Green Building, Ministry of Education (Tsinghua University), China

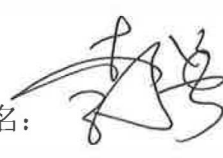
Received date: 2013-04-11; **Accepted date:** 2013-06-27

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第四部分 年度工作情况专家评分表


2014 年生态规划与绿色建筑教育部重点实验室 (清华大学)

工作情况评价表

| 评价内容 | | 评分 |
|---|-------------|----|
| 发展规划与目标完成 (10 分) | 规划目标完成情况 | 9 |
| 研究水平与贡献 (45 分) | 定位与研究方向 | 44 |
| | 研究成果及水平 | |
| | 技术创新贡献度 | |
| 队伍建设与人才培养 (25 分) | 队伍结构与创新团队建设 | 24 |
| | 青年骨干人才培养 | |
| | 学生培养 | |
| 开放交流与运行管理 (20 分) | 开放交流 | 19 |
| | 运行管理与机制创新 | |
| 总分 | | 96 |
| 学术委员意见及建议 | | |
| <p>该重点实验室在2014年23年中， 科研成果，人才培养取得突出。</p> <p style="text-align: right;">签名: </p> <p style="text-align: right;">日期: 年 月 日</p> | | |

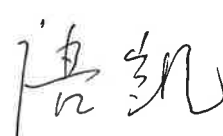
2014 年生态规划与绿色建筑教育部重点实验室（清华大学）

工作情况评价表

| 评价内容 | | 评分 |
|--|-------------|----|
| 发展规划与目标完成（10 分） | 规划目标完成情况 | |
| 研究水平与贡献（45 分） | 定位与研究方向 | |
| | 研究成果及水平 | |
| | 技术创新贡献度 | |
| 队伍建设与人才培养（25 分） | 队伍结构与创新团队建设 | |
| | 青年骨干人才培养 | |
| | 学生培养 | |
| 开放交流与运行管理（20 分） | 开放交流 | |
| | 运行管理与机制创新 | |
| 总分 | | 95 |
| 学术委员意见及建议 | | |
| <div style="text-align: right; margin-top: 50px;"> 签名:  </div> <div style="text-align: right; margin-top: 20px;"> 日期: 年 月 日 </div> | | |


2014年生态规划与绿色建筑教育部重点实验室（清华大学）

工作情况评价表

| 评价内容 | | 评分 |
|--|-------------|----|
| 发展规划与目标完成（10分） | 规划目标完成情况 | 10 |
| 研究水平与贡献（45分） | 定位与研究方向 | 45 |
| | 研究成果及水平 | |
| | 技术创新贡献度 | |
| 队伍建设与人才培养（25分） | 队伍结构与创新团队建设 | 25 |
| | 青年骨干人才培养 | |
| | 学生培养 | |
| 开放交流与运行管理（20分） | 开放交流 | 18 |
| | 运行管理与机制创新 | |
| 总分 | | 98 |
| 学术委员意见及建议 | | |
| <div style="text-align: right; margin-top: 50px;"> 签名：  </div> <div style="text-align: right; margin-top: 10px;"> 日期： 年 月 日 </div> | | |


2014 年生态规划与绿色建筑教育部重点实验室（清华大学）

工作情况评价表

| 评价内容 | | 评分 |
|---|-------------|----|
| 发展规划与目标完成（10 分） | 规划目标完成情况 | 9 |
| 研究水平与贡献（45 分） | 定位与研究方向 | 42 |
| | 研究成果及水平 | |
| | 技术创新贡献度 | |
| 队伍建设与人才培养（25 分） | 队伍结构与创新团队建设 | 23 |
| | 青年骨干人才培养 | |
| | 学生培养 | |
| 开放交流与运行管理（20 分） | 开放交流 | 18 |
| | 运行管理与机制创新 | |
| 总分 | | 92 |
| 学术委员意见及建议 | | |
| <div style="text-align: right; margin-top: 50px;"> 签名:  </div> <div style="text-align: right; margin-top: 20px;"> 日期: 年 月 日 </div> | | |


2014 年生态规划与绿色建筑教育部重点实验室（清华大学）

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| | 研究成果及水平 | |
| | 技术创新贡献度 | |
| 队伍建设与人才培养（25分） | 队伍结构与创新团队建设 | |
| | 青年骨干人才培养 | |
| | 学生培养 | |
| 开放交流与运行管理（20分） | 开放交流 | |
| | 运行管理与机制创新 | |
| 总分 | | 90 |
| 学术委员意见及建议 | | |
| <div style="text-align: right; margin-top: 100px;"> 签名:  日期: 2018年8月23日 </div> | | |

2014 年生态规划与绿色建筑教育部重点实验室（清华大学）

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| 研究水平与贡献（45分） | 定位与研究方向 | |
| | 研究成果及水平 | |
| | 技术创新贡献度 | |
| 队伍建设与人才培养（25分） | 队伍结构与创新团队建设 | |
| | 青年骨干人才培养 | |
| | 学生培养 | |
| 开放交流与运行管理（20分） | 开放交流 | |
| | 运行管理与机制创新 | |
| 总分 | | 96 |
| 学术委员意见及建议 | | |
| <p>建议在家庭经济适用房方面进一步聚焦。 更加突出生态、绿色的主题。</p> <p style="text-align: right;">签名: </p> <p style="text-align: right;">日期: 年 月 日</p> | | |

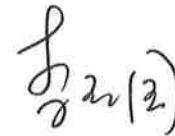
2014 年生态规划与绿色建筑教育部重点实验室（清华大学）

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| | 技术创新贡献度 | |
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| | 青年骨干人才培养 | |
| | 学生培养 | |
| 开放交流与运行管理（20分） | 开放交流 | |
| | 运行管理与机制创新 | |
| 总分 | | 93 |
| 学术委员意见及建议 | | |
| <p>本重点实验室技术团队强，科研扎实，成果转化率高，人才培养效果好，科研成果扩散应用成效显著，建议继续生态与建筑跨学科交叉的协同攻关，强化基础研究。</p> <p>签名：何琦</p> <p>日期： 年 月 日</p> | | |


2014 年生态规划与绿色建筑教育部重点实验室（清华大学）

工作情况评价表

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|--|-------------|----|
| 发展规划与目标完成（10分） | 规划目标完成情况 | 10 |
| 研究水平与贡献（45分） | 定位与研究方向 | 45 |
| | 研究成果及水平 | |
| | 技术创新贡献度 | |
| 队伍建设与人才培养（25分） | 队伍结构与创新团队建设 | 24 |
| | 青年骨干人才培养 | |
| | 学生培养 | 25 |
| 开放交流与运行管理（20分） | 开放交流 | 20 |
| | 运行管理与机制创新 | |
| 总分 | | 99 |
| 学术委员意见及建议 | | |
| <div style="text-align: right; margin-top: 50px;"> 签名:  </div> <div style="text-align: right; margin-top: 10px;"> 日期: 2018年 8 月 22 日 </div> | | |

2014 年生态规划与绿色建筑教育部重点实验室（清华大学）

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| | 学生培养 | |
| 开放交流与运行管理（20分） | 开放交流 | 17 |
| | 运行管理与机制创新 | |
| 总分 | | 93 |
| 学术委员意见及建议 | | |
| <div style="text-align: right; margin-top: 50px;"> 签名:  日期: 年 月 日 </div> | | |