Chaopeng Hong

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EDUCATION

TSINGHUA UNIVERSITY, BEIJING, CHINA

Ph. D. Candidate, Environmental Science and Engineering 09/2012-07/2017

Publications: 8 SCI papers (2 first-author papers; another 2-3 papers in preparation)

Advisors: Kebin He and Qiang Zhang

B.E. Degree, Environmental Engineering, School of Environment 09/2008-07/2012

Score: 91/100 (ranking: 2/96); recommended admission to be a Ph. D. student without examination

ACADEMIC EXPERIENCE

Visiting Scholar, Department of Marine, Earth, and Atmospheric Sciences 05/2015-04/2016

North Carolina State University, Raleigh, NC, USA

RESEARCH INTERESTS

- Interactions between atmospheric composition and climate change
- Climate and air quality policy assessment and public health
- Emission inventory and future projection

RESEARCH ACTIVITIES

Thesis research: Modeling the climate-chemistry interactions and their roles in future climate change and air quality projection over China 02/2014-07/2017

- **Multi-year downscaling application of online coupled WRF-CMAQ over East Asia for regional climate and air quality modeling: model evaluation and aerosol direct effects** (paper published in GMD)
  A regional coupled climate-chemistry modeling system using the dynamical downscaling technique was established by linking the global CESM and the online coupled WRF-CMAQ, and evaluated over East Asia.
- **Projection of future climate "penalty" on air quality and public health over China** (paper in preparation)
  Future climate change over China and its impacts on air quality and public health under RCP 4.5 around 2050s were projected by the regional climate-chemistry modeling system and the health impact assessment model.
- **Impacts of aerosol direct effects on future climate change and air quality over China** (paper in preparation)
  By including chemistry-climate interactions in the regional coupled climate-chemistry modeling system, the important role of aerosol direct effects in regional future climate and air quality projection and the associated health impacts were addressed through sensitivity simulations.
- **Win-win strategies for mitigating climate change and improving air quality in China** (paper in preparation)
  Develop technology-based emission scenarios for China up to 2050 on the framework of the *Multi-resolution Emission Inventory for China (MEIC)* model.
  Assess the effects of China's climate/air quality policies on future air quality, health and climate (radiative forcing) over China by using the coupled WRF-CMAQ and the health model, and propose win-win strategies.

China and the New Climate Economy: cleaning China's air 03/2014-05/2015

- Review of China's air quality: current status, national actions, achievements, and challenges.
- Analyze the need of energy conservation and emission reduction measures for China’s cities to achieve 2030 air quality targets by using the WRF-CMAQ model and several emission scenarios.

Assessment of air quality benefits in the Beijing-Tianjin-Hebei region under China's Action Plan for Air Pollution Prevention and Control 09/2013-12/2014

- Project emission changes of air pollutants under the Action Plan (2012-2017), and assess the air quality benefits using the WRF-CMAQ model. Analyze co-benefits of CO_2 and BC mitigation from the Action Plan.
- Published a research report online (this research has been reported by Chinese media and MEP).

Uncertainties in China's energy statistics and the impacts on emission estimates 11/2012-09/2014

- Attempt to improve the understanding of uncertainties in China's energy statistics and evaluate their impacts on China's emissions during 1990-2013 by using the MEIC inventory and different official energy statistics.

Other researches/projects

- Participate in the preparation of *Technical guidance to prepare primary $PM_{2.5}$ emission inventories* (organized by Chinese *MEP - Ministry of Environmental Protection*).
- Comprehensive evaluation of multi-year real-time air quality forecasting using an online-coupled meteorology-chemistry model (WRF/Chem-MADRID) over southeastern United States.

PUBLICATIONS

[1] **Hong C**, Zhang Q, He K, et al. Variations of China's emission estimates: response to uncertainties in energy statistics. *Atmos. Chem. Phys.*, 2017, 17: 1227-1239.

[2] **Hong C**, Zhang Q, Zhang Y, et al. Multi-year downscaling application of two-way coupled WRF v3.4 and CMAQ v5.0.2 over east Asia for regional climate and air quality modeling: model evaluation and aerosol direct effects. *Geosci. Model Dev.*, 2017, 10: 2447-2470.

[3] Zhang Y, **Hong C**, et al. Comprehensive evaluation of multi-year real-time air quality forecasting using an online-coupled meteorology-chemistry model over southeastern United States. *Atmos. Environ.*, 2016, 138: 162-182.

[4] Jiang X, **Hong C**, et al. To what extent can China's near-term air pollution control policy protect air quality and human health? A case study of the Pearl River Delta region. *Environ. Res. Lett.*, 2015, 10 (10):104006.

[5] Liu Z, Guan D, Wei W, Davis S J, Ciais P, Bai J, Peng S, Zhang Q, Hubacek K, Marland G, Andres R, Crawford-Brown D, Lin J, Zhao H, **Hong C**, et al. Reduced carbon emission estimates from fossil fuel combustion and cement production in China. ***Nature***, 2015, 524 (7565):335-338.

[6] Li M, Zhang Q, Kurokawa J, Woo J, He K, Lu Z, Ohara T, Song Y, Streets D G, Carmichael G R, Cheng Y, **Hong C**, et al. MIX: a mosaic Asian anthropogenic emission inventory under the international collaboration framework of the MICS-Asia and HTAP. *Atmos. Chem. Phys.*, 2017, 17: 935-963.

[7] Zheng B, Zhang Q, Tong D, Chen C, **Hong C**, et al. Resolution dependence of uncertainties in gridded emission inventories: a case study in Hebei, China. *Atmos. Chem. Phys.*, 2017, 17: 921-933.

[8] Liu F, Klimont Z, Zhang Q, Cofala J, Zhao L, Huo H, Nguyen B, Schoepp W, Sander R, Zheng B, **Hong C**, et al. Integrating mitigation of air pollutants and greenhouse gases in Chinese cities: development of GAINS-City model for Beijing. *J. Clean. Prod.*, 2013, 58:25-33.

[9] CAAC Policy Report: Can Beijing, Tianjin and Hebei achieve their $PM_{2.5}$ targets by 2017? Available at: http://en.cleanairchina.org/product/6789.html. (Lead author)

[10] NCC Report: China and the New Climate Economy: A New Climate Economy Case Study. Available at: http://newclimateeconomy.net/content/china-and-new-climate-economy. (Lead author on Chapter Environment)

PROFESSIONAL SKILLS

- Climate-chemistry modeling: online coupled WRF-CMAQ; dynamical downscaling; GEOS-Chem
- China's emission scenarios; China's policy assessment
- Computer language: NCL, IDL, FORTRAN, MATLAB, VBA, etc.
- Computer software: Origin, ArcGIS, etc.