1.143 EMeRGe campaigns in Asia: Regional air pollutants prediction and simulation.

Presenting Author:
  Chuan-Yao Lin, Academia Sinica, Research Center for Environmental Changes, Taipei, Taiwan, yao435@gate.sinica.edu.tw

Co-Authors:
  Yang-Fan Sheng, Academia Sinica, Research Center for Environmental Changes, Taipei, Taiwan
  Wen-Mei Chen, Academia Sinica, Research Center for Environmental Changes, Taipei, Taiwan
  Mien-Tze Kueh, Academia Sinica, Research Center for Environmental Changes, Taipei, Taiwan
  Chin-Ying Chen, Academia Sinica, Research Center for Environmental Changes, Taipei, Taiwan

Abstract:

In the winter and spring times, the cold continental airs not only often outflow to Taiwan, but also bring air pollutants and dusts. Moreover, springtime happens to be the biomass burning season in Indochina. Under favor weather conditions, the products of biomass burning pollutants could be transported easily to Taiwan and even East Asia. Due to the unique geographic location of Taiwan, that allows us to receive more than just one source in spring. Actually, the complex interactions of these air pollutants and aerosols features in the boundary layer and aloft have resulted in complex characteristics of air pollutants and aerosols distributions in the lower troposphere over Taiwan and East Asia. The impacts are also essential and complex.

The project "Effect of Megacities on the transport and transformation of pollutants on the Regional and Global scales (EMeRGe)" aims to improve our knowledge and prediction of the transport and transformation patterns of European and Asian megacities pollutant outflows. In EMeRGe Asia, the composition of the plumes of pollution entering and leaving Asia measured by the new High Altitude and LOng Range (HALO) aircraft research platform. The HALO aircraft performing optimized transects and vertical profiling in Asia during 12 March and 7 April in 2018. To design the measurement of aircraft flight paths and elevations, a high resolution, 9 km, numerical prediction by Weather Research Forecast (WRF) and WRF-Chem models were joined and performed during the campaigns. The EMeRGe Asia has successfully finished more than 10 missions during study period. Model performances and preliminary results will discuss in this meeting. Overall, this series of studies significantly fill the gap of our understanding on air pollutants transformation and transport to Taiwan and East Asia, and show the potential directions of future studies.