

Long-range transport of Southeast Asia biomass burning pollutants to Taiwan: Impacts and implications

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It happens to be the biomass burning season in spring time from Indochina. Under favor weather conditions, the products of biomass burning pollutants could be transported easily to Taiwan and even East Asia. 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. For example, at the Lulin Atmospheric Background Station (LABS) (elevation 2862 m) in central Taiwan, the concentrations of carbon monoxide (CO), ozone (O₃) and particulate matter with diameter less than 10 μm (PM₁₀) were found to be 135-200 ppb, 40-56 ppb, and 13-26 μg/m³, respectively in the springtime (February-April) between 2006 and 2009, which are 2-3 times higher than those in other seasons.

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 LRT of biomass burning organic aerosol to Taiwan measured by HALO could be more than 2 ug/m³ at the elevation of 2500 m on 20 March, 2018. Model performances and the results will be discussed 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.

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