1.035 Monitoring and Forecasting Air Quality over China: Results from the PANDA Modeling System.

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Abstract:

With fast economic growth and development China is experiencing severe air pollution episodes related to rapid industrialization and urbanization since more than three decades. Through collaboration between 7 European and 7 Chinese research universities and institutes, the PANDA (Partnership with China on Space Data) EU-funded project aims to improve our understanding of the processes responsible for the formation, dispersion and destruction of air pollutants in East Asia. By combining space and in-situ observations and surface emissions of chemical pollutants with global and regional models of atmospheric composition, detailed analyses and reliable forecasts of regional air quality are produced with the aim of improving methods for monitoring and forecasting air quality in East Asia.

Using a multi-model approach based on several global and regional state-of the art model simulations, we present detailed modeling studies of recent notorious haze events in East Asia (winter 2010 and 2013 haze events). We will demonstrate the effect of uncertainties and differences in current emission inventories for China and their resolution and temporal variation on model performance. We will focus especially on major city clusters that have experienced intense urbanization and population growth. The importance of using a downscaling approach to better reproduce and predict air pollution events that occur in East Asia will be discussed. The relation between the performance of the models and the complexity of their chemistry and aerosol schemes and choice of boundary and atmospheric forcing will be assessed. We will also present results of the air quality forecasting system being developed within PANDA and in collaboration with the EU project MarcoPolo.