Multi-Model Ensemble Forecasts of Regional Air Quality in China

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As part of the EU-sponsored Panda and MarcoPolo projects, a quasi-operational system of air quality forecasting in China has been developed. The system is constructed with seven different chemical transport models which have different horizontal and vertical resolutions and use different emissions and meteorological data. The basic range of the individual forecasts is 72h with an initial forecast time at 00:00 UTC every day. The individual forecasts are combined to form multi-model ensemble forecasts to provide median and average values. Global predictions that include an assimilation process of space observations are downscaled to a spatial resolution of a few kilometers. The system provides predicted distributions of several compounds relevant for air quality including ozone and NO2, PM2.5 and PM10. The median values as well as individual forecasts for the 37 Chinese cities of more than 1 million inhabitants are posted daily on the projects website (http://www.marcopolo-panda.eu/forecast/) and continuously compared with local observations as these become available.

We will describe the forecasting system and present validations of the model predictions with surface measurements. We will also highlight problems encountered in particular the systematic biases that can affect the skills of all or a part of the individual forecasts during specific situations.