Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Operational birch pollen forecast in Europe using the numerical pollen dispersion model COSMO-ART

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In Europe, about 15% of the population suffer from pollinosis. Pollen forecasts are a helpful tool for medical doctors to advise the patients. In addition, they can assist allergy sufferers to plan the leisure time and to plan the medicine intake which reduces the symptoms. This highlights the need for regionally detailed pollen forecasts.

We present the experiences of the operational birch pollen forecast that was performed using the numerical pollen dispersion model COSMO-ART (COnsortium for SMall-scale Modeling - Aerosols and Reactive Trace gases) during the birch pollen season 2011. The operational set-up is outlined and the performance of COSMO-ART is demonstrated using various verification techniques.

COSMO is a non hydrostatic mesoscale model that is used in operational weather forecasts in a number of European weather services including those of Switzerland and Germany. The ART module describes the chemical reactions and the aerosol dynamics as well as the pollen emission and dispersion processes.

For the pollen module a phenological heat sum model is used to predict the start and the end of the pollen season. This model performed very well in the verification process with an average accuracy of 2-3 days. The pollen season is described by various sigmoidal functions. The parameterization of the pollen emission is superposed on these seasonal factors and depends strongly on the meteorological conditions. The calculation of the settling velocity takes into account that the pollen grains can hydrate or dehydrate.