SORS: How to ingest measurements into a computer simulation: data assimilation enhancement of an atmospheric model

Speaker: Enza Di Tomaso

Abstract: This talk describes the outcome of my visit to the Atmospheric, Oceanic and Planetary Physics department of the University of Oxford in UK, sponsored by the Severo Ochoa mobility programme. The major result of the collaboration with the local host has been the enhancement of an atmospheric model maintained by the Earth Sciences department, the NMMB/BSC Chemical Transport Model, with a data assimilation tool, i.e. a tool able to ingest measurements into a computer simulation of a real system.

I'll give a brief introduction to the specific implementation of an ensemble Kalman filter that we have coupled with our atmospheric model, and show how we use it for aerosol data assimilation in order to aid the forecast of aerosol concentrations in the atmosphere. The specific type of ensemble Kalman filter that we use is particularly suited to high performance computing applications and is able to improve the forecast of our model.

The assimilation of measurements into atmospheric models combines many concepts from mathematical, physical and computing areas of research, and might therefore be of interest to BSC scientists from a variety of backgrounds.

Short Bio: Enza Di Tomaso has a degree in Physics from the University of Bologna in Italy and a PhD in Engineering Mathematics from the University of Bristol in UK. She has worked as lecturer at the University of Bristol before moving to the field of atmospheric science, initially working for the Italian Research Council on the retrieval of precipitation from satellite observations, and subsequently working at the European Centre for Medium-Range Weather Forecasts in Reading, UK, on exploiting satellite observations for Numerical Weather Prediction. Recently, at BSC, she has expanded her interest to atmospheric chemistry and in particular to aerosol data assimilation.