



## **Simulations of sulphate's concentrations over Europe**

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One of the main difficulties of climate modelling is to correctly simulate the negative regional aerosols impact on the Earth global warming. A first step to address this issue is to evaluate the tropospheric vertical distribution of submicronic aerosol (including sulphate and organic aerosol).

After having studied the transport of lead-210, a passive tracer of atmospheric circulation, we simulate sulphate transport and chemistry. Simulations of the concentrations of this aerosol have been made for the years 2002 and 2003 with the recent three-dimensional Chemistry and Transport Model MOCAGE (Model Of atmospheric Chemistry At larGE scale). It is a multi-scale model, from the global domain ( $2^\circ \times 2^\circ$ ) down to the regional one ( $0.25^\circ \times 0.25^\circ$ ). The meteorological analyses come from ARPEGE, the Meteo-France's forecasting model. A specific module of sulfur's chemistry was introduced in MOCAGE.

The simulations results are compared, over Europe, with the EMEP data and CARBOSOL project observed data, for the sulfur dioxide and sulphate. The CARBOSOL stations were instrumented and have collected atmospheric aerosol (inorganic versus organic) data at various points of Europe (Azores, Aveiro on Portuguese coast, Puy de Dome 1500 m France, Schauinsland 1500m Germany, Sonnblick 3000 m Austria, K-pustka Hungary plain). A particular attention is paid to the convection simulation by the model. Thus the results analysis focuses on high altitude sites, where the convection induces a strong seasonality of the sulphate concentration (maximum in summer, minimum in winter).