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GEMS: Evaluation of the aerosol component

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GEMS (Global and regional Earth-system Monitoring using Satellite and in-situ data) is an integrated project under the EU sixth framework program. The goal of GEMS is to develop a global operational medium and short-range forecast tool for air chemistry by the year 2008. The new tools will be designed to assimilate available near real-time (remote sensing and in-situ) data on atmospheric composition for improved predictions for regional levels of gaseous pollutants and aerosols. To simulate aerosol appropriately, aerosol interactions with chemistry and clouds as well as the variability of aerosol (e.g. amount, composition, size and altitude) must be properly represented. In the framework of the ECMWF forecast model, a simplified new aerosol module with only four tracers ('gas-phase' and 3 size classes [large sea-salt, large dust, all other aerosol]) has been developed. In initial simulations covering the years 2003 and 2004 this new aerosol module is repeatedly applied in a 12-hour forecast mode. Necessary aerosol emissions are either parameterized (e.g. sea-salt, dust) or prescribed via available aerosol emission data bases (e.g. AeroCom, GFED). In this presentation, strength and deficiencies of this new approach are examined in comparison to available remote sensing data from ground and space.