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Validation of the GMES Atmosphere Service global composition reanalysis

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The MACC-II (Modelling Atmospheric Composition and Climate, http://www.gmes-atmosphere.eu/) project is establishing the core global and regional atmospheric environmental services delivered as a component of Europe's Copernicus (The European Earth Observation Programme) initiative. The global reanalysis service of MACC-II consist of a multi-year reanalysis for the period 2003-2012 of atmospheric composition produced with the MACC system. This reanalysis is obtained by assimilating trace gas concentrations and aerosol properties as measured by operational and research satellites. Apart from the reanalysis, MACC provides daily near-real time forecasts of atmospheric composition. A dedicated validation activity exists within MACC-II to provide a routine validation of the NRT and reanalysis services based on independent observations (in-situ, remote sensing and satellite).
In our contribution we will discuss the validation approach, system description, and validation results of the MACC-II global atmospheric composition reanalysis for the period 2003-2011. The performance of the system is assessed in two ways: both the longer-term mean performance (trend, seasonality) as well as its ability to capture events are documented. During MACC II a series of validation reports is produced, updated every 6 months, to document the validation statistics of the reanalysis service.