



Comparison between assimilated and non-assimilated experiments of the MACCii global reanalysis near surface ozone

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In this work we evaluate near surface ozone concentrations of the MACCii global reanalysis using measurements from the EMEP and AIRBASE database. The eight-year long reanalysis of atmospheric composition data covering the period 2003–2010 was constructed as part of the FP7-funded Monitoring Atmospheric Composition and Climate project by assimilating satellite data into a global model and data assimilation system (Inness et al., 2013). The study mainly focuses in the differences between the assimilated and the non-assimilated experiments and aims to identify and quantify any improvements achieved by adding data assimilation to the system. Results are analyzed in eight European sub-regions and region-specific Taylor plots illustrate the evaluation and the overall predictive skill of each experiment. The diurnal and annual cycles of near surface ozone are evaluated for both experiments. Furthermore ozone exposure indices for crop growth (AOT40), human health (SOMO35) and the number of days that 8-hour ozone averages exceeded 60ppb and 90ppb have been calculated for each station based on both observed and simulated data. Results indicate mostly improvement of the assimilated experiment with respect to the high near surface ozone concentrations, the diurnal cycle and range and the bias in comparison to the non-assimilated experiment. The limitations of the comparison between assimilated and non-assimilated experiments for near surface ozone are also discussed.