



The GEMS global reactive gases subproject: Reanalysis and near-realtime forecasts of the GEMS-GRG system

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The global reactive gases subproject in GEMS (Global Environmental Monitoring using Satellite and in-situ data) is setting up a modelling framework for monitoring and forecast of tropospheric and stratospheric ozone and its precursor species (CO, NO_x, Formaldehyde). The chemistry transport model MOZART has been coupled to ECMWF's integrated forecast system IFS exchanging trace gas concentrations and meteorological variables from IFS to the CTM and chemical tendencies from the CTM to IFS. This model has been run in an unsupervised forecast mode throughout the second half of the year 2007 and in a reanalysis simulation covering the year 2003. For the reanalysis ozone and CO have been assimilated with a 6hour 4DVAR scheme and SCIAMACHY tropospheric NO₂ columns have been monitored passively. Near real time trial forecasts are presently running without chemical data assimilation.

We present results from the coupled system MOZART-IFS with and without data assimilation. The results from the coupled model are evaluated using independent data from ground-based networks, aircraft observations and independent satellite retrievals. The GEMS-GRG model results are also compared to MOZART simulations without data assimilation and specific attention is given to model transport characteristics. We will further outline the strategy and technical design of the GEMS-GRG modelling system and the future development path towards a fully operational global atmospheric service.