



## **An assessment of the TM5 stand-alone and coupled runs in the framework of GEMS.**

V. Huijnen (1), **H. Eskes** (1), J. Flemming (2), A. Segers (3), M. van Weele (1) and T.C.P. van Noije (1)

(1) KNMI, De Bilt, The Netherlands {vincent.huijnen@knmi.nl}, (2) ECWMF Reading, United Kingdom, (3) now at TNO, Utrecht, The Netherlands

The aim of the EU GEMS subproject on Global Reactive Gases is to setup a system where chemical transport modeling is coupled to the ECMWF IFS system, to establish an operational forecast system of atmospheric chemistry and dynamics. Within this project TM5 serves as one of the independent chemical transport models. At the current stage the coupling to IFS is performed in two ways: the CTM constrained mode where the IFS concentration fields for all chemically transported species are updated at the start of each forecast by the CTM, and the feedback-mode, where vertical transport is modeled in the IFS, and returned to the CTM.

The chemical transport model TM5 is critically assessed both in a stand-alone mode and in a coupled mode to the IFS system. Two time-periods are selected: the year 2003 and more specifically the 2003 heat wave period. A sensitivity study in the stand-alone runs illustrates that the update of the antropogenic emissions for CO using the new IIASA values has a notable effect on the CO burden. These changes in the emission data are shown to be of more relevance than an update of the chemical mechanism CBM4.

Consistent results are obtained for the different TM5 coupled runs and the stand-alone run. These results are also compared to the MOZART - IFS system, and independent measurements.