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MIPAS/ENVISAT observations of decay products of isoprene and other hydrocarbons in the upper troposphere and simulations with the new mechanism MIM3 in the CCM EMAC

C. Brühl (1), D. Taraborrelli (1), T. von Clarmann (2), N. Glatthor (2), A. Wiegele (2), and B. Funke (3)

(1) Max-Planck-Institut für Chemie, Abt. Luftchemie, Mainz, Germany (christoph.bruehl@mpic.de, 49 6131 305436), (2) Karlsruhe Institute of Technology, Institut für Meteorologie und Klimaforschung, Karlsruhe, Germany, (3) Instituto de Astrofisica de Andalucia, Granada, Spain

Simultaneous limb observations of HCOOH, CO, PAN, C_2H_6, O_3, NO_x and other species by MIPAS in the upper troposphere and lower stratosphere are compared with results of the chemical circulation model EMAC. To allow for point by point comparisons with the satellite data, the tropospheric meteorology of the CCM is nudged by observations of ECMWF. The method is used for evaluation and further development of the new isoprene oxidation scheme MIM3 and also for checking and distinguishing biogenic and anthropogenic emissions used in the model. We show that the model is able to reproduce the main features of the observations, including the seasonal cycle, and that proper modelling of isoprene chemistry (and to less extent terpene chemistry) is critical for understanding the observed chemical composition of the upper troposphere.