



## **Offline calculations of erythemal irradiance based on a chemistry- climate model output**

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This study presents off-line erythemal irradiance calculations based on predictions of ozone and clouds as calculated with the Chemistry-Climate Model ECHAM5/MESy. The aim is to investigate the agreement between the radiation predicted from the CCM and observations. Detailed cloud (i.e. cloud fraction, liquid and ice water path and content, droplet and particle effective radii) and aerosol optical depth was derived from a 3-year run of ECHAM5/MESy (version 0.9) with horizontal resolution T63. Optical parameters for clouds and aerosols are derived for the 4 spectral bands (250-690 nm, 690-1190 nm, 1190- 2380 nm, 2380- 4000 nm) of the model. The vertical ozone distribution and column were derived from a 3-year run of the middle atmosphere version of ECHAM5/MESy (in T31L39MA resolution). Both runs started at the same initial conditions, representative for the late 1970's. The erythemal irradiance over Europe was then calculated using the radiative transfer model LibRadtran. The magnitude and variability of the erythemal irradiance is compared to the one derived from TOMS on-board Nimbus 7 satellite.