Geophysical Research Abstracts
Vol. 16, EGU2014-575-1, 2014
EGU General Assembly 2014

HIGH RESOLUTION DYNAMICAL-CHEMICAL MODELLING OF THE UPPER TROPOSPHERE AND LOWER STRATOSPHERE REGION OVER EUROPE: GEM-AC MODEL SIMULATIONS FOR CURRENT AND FUTURE CLIMATE

Magdalena Porebska (1), Joanna Struzewska (1), and Jacek Kaminski (2)

(1) Warsaw Univerity of Technology, Environmental Engineering, Warsaw, Poland (magdalena.porebska@is.pw.edu.pl, 4822 6254305), (2) Centre for Research in Earth and Space Science, York University, Toronto, Canada

Upper troposphere and lower stratosphere (UTLS) region is a thin layer around the Tropopause. Perturbation of the chemical composition in the UTLS region can impact physical and dynamical processes which can lead to changes in cloudiness, precipitation, radiative forcing, stratosphere-troposphere exchange and zonal flow.

The reported research aims at supplementing the existing knowledge by a systematic modeling study for current and future climate scenarios. The tool used here is the GEM-AC model which is an on-line and interactive tropospheric and stratospheric chemistry model with unique capability to run in a global variable resolution where uniform portion of the computational grid can be placed over the region of interest. In this study, a global variable resolution grid will be used with horizontal resolution 0.3 x 0.3 deg over Europe. The model will be integrated on 80 hybrid levels with the top at 0.1 hPa and $\sim$500 m vertical resolution in the UTLS region.

Analysis will focus on changes in the concentration of chemical species and families such as: O_3, NO_x, NO_y, BrO_x, ClO_x, HO_x and CH_4 in the UTLS region. Analysis of zonal and monthly averaged vertical profiles and cross-section of chemical components for current and future climate and their differences due to climate changes will be presented.