(1) EurCTM - Chemistry transport model of the gas composition for Eurasia: off-line numerical model for Eurasia's tropospheric and stratospheric chemical gases

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(3) Available modes for the model runs: Research and Operational

(4) Components & processes: Atmosphere & Physical, Chemical

(5) Brief model description

EurCTM is off-line numerical chemistry transport model for Eurasia developed in the Russian State Hydrometeorological University (RSHU). The target of the model is directed toward the prediction of the air quality and stratospheric composition change as well as the elucidation of the link between regional and mesoscale processes. The model is based on INM-RSHU CCM (Climate Chemistry Model) (Galin et al, 2007). Two categories of atmospheric species studied in the model are long-lived greenhouse gases (CO2, CH4, etc.) and short-lived reactive species (O3, NOx, CO, SO2, VOC etc.) The model whole chemical scheme includes 74 components interacting in 174 chemical (both gaseous and heterogeneous) reactions and 51 photodissociation processes. Chemical species atmospheric transport is driven by the wind every 6 hours operationally assimilated from the Global Forecast System (GFS). In addition to wind, GFS temperature, humidity and surface pressure fields are used by the EurCTM to account for the impact of meteorological processes on the change in the gas composition of Eurasia.

The horizontal resolution of the model is 0.5 degrees latitude-longitude and it has 22 vertical levels from the surface up to 10 hPa (about 32 km). EurCTM is coupled with the global CCM, to specify the initial and boundary conditions in order to take into account the influence of global processes on the gas composition of Eurasia. The model assimilates the GFS meteorological data every morning (analysis for the previous day and the forecast for the next three days) and calculates the change in the gas composition for the previous day in the analytical mode, and then predicts its change for the next three days. Observational data of the surface concentrations and the total content of atmospheric gases can be assimilated by the model using nudging procedure to form initial conditions in the analytical and prognostic modes.

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