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The Deep Convection Simulations and the Distribution of Ozone under the Model *ARPEGE*

The results on the interaction between the convection and the tropopause structure are taken on the basis of a 100-year simulation (period 1950-2050) using the model ARPEGE.

The interaction between the deep convection and the tropopause structure is still not very well understood. Because the tropopause is not only controlled by the radiative-convective adjustment but also by stratospheric processes (dynamical heating, ozone and water stratospheric distribution), the top of the convective clouds is sometimes below the tropical tropopause altitude.

Tropical convection developing above the Atlantic ocean might also interact with the subtropical jet modifying the dynamical characteristics of the tropopause region and inducing exchange of air masses across the jet. These mechanisms were investigated in the measurement campaigns south of the Canaries Islands.

The version of the model used for this simulation is a tropospheric-stratospheric version, with 65 levels from the ground up to the stratopause, and it is run in the spectral space. The ozone mixing ratio is also a variable of the model, with a simplified parametrization of its sinks following the approach of Déqué (1986) and chemistry is introduced using ozone destruction rates computed with the CTM developed at METEO-FRANCE. Greenhouse gases (CO_2 , CH_4 , N_2O) concentrations are prescribed to the model according to the historical data and scenario.

In this research a special attention is focused on the deep convection and the tropopause structure, changes in the ozone concentration and chemistry, and related temperature and general circulation changes, and their links with changes in the troposphere.