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A revised ozone parameterisation scheme: COPCAT coefficients within SLIMCAT simulations.

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Nowadays, numerical weather prediction (NWP) models tend to extend their vertical range into the stratosphere/mesosphere, and include ozone as one of their prognostic variables. One of the motivations for the incorporation of stratospheric ozone is the improvement of the forecasts expected from a more accurate assimilation of radiances than that achieved using an ozone climatology. However, for computational cost reasons, operational NWP models do not implement a complete ozone chemistry and use simplified ozone photochemical parameterisations instead.

The most widely used ozone parameterisation is the Cariolle and Déqué linear scheme (CD scheme) [*Cariolle and Déqué*, 1986], which is a linearization of ozone sources and sinks in terms of temperature, local ozone and ozone column above the considered grid point. The coefficients for the CD gas-phase scheme can be provided by off-line photochemical models [*Cariolle and Déqué*, 1986; *McLinden et al.*, 2000; *McCormack et al.*, 2004; 2006]. The effects of the heterogeneous chemistry on ozone are considered by adding an heterogeneous term to the CD scheme.

In this work a new set of coefficients (COPCAT) has been derived for the CD scheme using the off-line SLIMCAT chemical transport model (CTM). The SLIMCAT stratospheric chemistry includes reactions occurring on liquid aerosols, solid NAT and ice particles, therefore, the new COPCAT coefficients, unlike previous sets of coefficients, take into account the effects of the heterogeneous chemistry.

In addition, this approach allows us to compare the performance of the CD scheme within the CTM used to obtain the coefficients against full-chemistry runs of the same CTM. With no biases due to the use of two different models (one for calculating the coefficients and one for implementing the CD parameterisation), this way provides clearer information on the regions where the CD scheme may be less suitable.

We present ozone distributions obtained with these new COPCAT coefficients and compare them against full-chemistry runs of SLIMCAT, and against results obtained with other existing sets of coefficients for the CD ozone scheme.

We are also investigating the effect of using different analysed winds to drive the 3D SLIMCAT model, as well as the possibility of a stratospheric water vapour parameterisation through the ozone scheme derived from SLIMCAT.