

Dear chemistry-climate modelers,

August 4, 2005

As announced earlier (email 20/12/04, Subject: CCMVal kick-off intercomparison), we have started a comprehensive CCM intercomparison within CCMVal. We would like to thank all groups who have already contributed to this.

For a more detailed assessment of the evolution of total ozone, we would like to extend the analyses to total and partial column ozone and ozone depletion indices in transient simulations that prescribe the changes in GHG and ozone depleting substances from 1960 to 2100 (or shorter time period). In addition to existing CCM simulations, this data request is also a call for model results from the REF1, REF2, SCN1, and SCN2 simulations (defined at http://www.pa.op.dlr.de/CCMVal/Forcings/CCMVal_Forcing.html). The results of the intercomparison are planned to feature prominently in the 2006 WMO/UNEP ozone assessment. The runs into the future (REF2 and SCN2) will provide the basis for Chapter 6 of the assessment entitled 'The ozone layer in the 21st century'. This chapter will also validate all 4 CCMVal model runs through historical (1980 or earlier to 2004) intercomparisons with observed ozone changes taken from Chapters 3 and 4 of the assessment. Chapter 5 of the assessment entitled 'Climate-Ozone Connections' will also make use of all 4 model simulations as illustrative case studies of the interactions between ozone and climate. The lead authors of these two chapters (Martin Dameris and Mark Baldwin for Chapter 5, Greg Bodeker and Darryn Waugh for Chapter 6) therefore strongly encourage the CCMVal community to submit these model data sets as soon as possible so that they can be used in the assessment.

We would appreciate if you could provide us with ozone datasets covering the entire period of your model simulations. If you already have ensembles, please send data for each ensemble member.

For the planned analyses we would need the following data:

1. 2D Monthly Mean Total Column Ozone Fields for the entire period

Please follow the instructions at **ICD 2c** on the Interface Control Document <http://www.pa.op.dlr.de/SCOUTO3/InterfaceControlDocument.html> and use data set name:

MEANTOZ_\${Startyear}to\${Endyear}_LATLON_\${Model}_\${Ensemble}

- e.g. **\${Startyear}** = 1980, **\${Endyear}** = 2050
- e.g. **\${Model}** = UMETRAC
- **\${Ensemble}** = 1, 2, ..., N = number of simulation in your ensemble (from 1 to N, where N is the number of available simulations in your ensemble).
- ASCII format

2. Antarctic ozone depletion indices

- (a) Daily minimum total ozone throughout the latitude **60° to 90°S** in July through December in the Southern Hemisphere
- (b) Daily measures of the area over Antarctica (considering only data **poleward of 40°S**) where ozone values are below 150 DU, below 220 DU, more than 30% below 1980 to 1982 means, and more than 50% below 1980 to 1982 means during the period July to December. So when calculating the ozone depletion indices as 30% and 50% below 1980-1982 means, these means are calculated as a function

of latitude, longitude and calendar day. So for example, if you are looking at the ozone in a grid box centered on 60S, 90W on 1 October 1990, you add the grid box area to the total according to:

- if it is below 220 DU
- if it is below 150 DU
- if it is 30% below the average ozone at 60S, 90W from 1 October 1980, 1 October 1981 and 1 October 1982 (three values averaged).
- if it is 50% below the average ozone at 60S, 90W from 1 October 1980, 1 October 1981 and 1 October 1982 (three values averaged).

So the climatology against which the ozone values are compared is a function of latitude, longitude and calendar day of the year.

- (c) Daily values of the ozone mass deficit based on an $O_3 < 220$ DU threshold. Only ozone values **poleward of 40°S** must be considered. The ozone mass deficit, in kg, for a given area is calculated as: $(220-x) \times 2.11 \times 10^{-5} \times A$ for $x < 220$, where x is the total column ozone in DU and A is the area in m^2 of the region over which the mass deficit is calculated (TOMS cell for measurements, model grid cell for model output)
- (d) Date of disappearance of 220 DU ozone values each year **poleward of 40°S**
- (e) Date of disappearance of 150 DU ozone values each year **poleward of 40°S**

Please follow the instructions at **ICD 9b and c** on the Interface Control Document <http://www.pa.op.dlr.de/SCOUTO3/InterfaceControlDocument.html> and use data set name:

MinMaxTOZDailySH_\${Startyear}to\${Endyear}_\${MODEL}_\${Ensemble}

Includes (2a), (2b), and (2c)

MinMaxTOZSH_\${Startyear}to\${Endyear}_\${MODEL}_\${Ensemble}

Includes (2d), (2e)

- ASCII format

3. Arctic ozone depletion indices

- (a) Daily minimum total ozone throughout the latitude **60° to 90°N** in December through April in the Northern Hemisphere

Please follow the instructions at **ICD 9b** on the Interface Control Document <http://www.pa.op.dlr.de/SCOUTO3/InterfaceControlDocument.html> and use data set name:

MinMaxTOZDailyNH_\${Startyear}to\${Endyear}_\${MODEL}_\${Ensemble}

Includes (3a)

- ASCII format

4. Daily Partial Ozone Columns over four altitude and four latitude ranges

- (a) 100-200 hPa, 50-100 hPa, 10-50 hPa and 50-150 hPa
- (b) 60°-70°S, 70°-80°S, 80°-90°S and 60°-90°S

Please follow the instructions at **ICD 2d** on the Interface Control Document <http://www.pa.op.dlr.de/SCOUTO3/InterfaceControlDocument.html> and use data set name:

TOZpartialDaily_\${Startyear}to\${Endyear}_\${MODEL}_\${Ensemble}

➤ ASCII format

5. Description of model runs and model set-up

For each simulation, please provide details on the model design and set-up as well as the forcings used for each run. In addition, please let us know how the runs have been evaluated along with a reference, if available. We need some basic validation in order to include the results in the upcoming WMO/UNEP assessment.

The proposed CCMVal simulations should be assigned with REF1, REF2, SCN1 or SCN2 (e.g. **$\{\text{Ensemble}\} = 1_REF1, 2_REF1, \dots, N_REF1$**)

Please send an email to Veronika Eyring (Veronika.Eyring@dlr.de) once you are ready to put the data on the ftp site. The data will **be stored at the SPARC data center**. Details of the ftp site will be provided on request.

We are hoping to show preliminary results at the CCMVal 2005 Boulder workshop in October.

Thank you for your cooperation.

Best regards,

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On behalf of the CCM Validation Activity for SPARC

Details on previous data requests and formats can be found at
<http://www.pa.op.dlr.de/SCOUTO3/InterfaceControlDocument.html>