Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., community comment CC1
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Comment regarding the Romanowsky et al., 2019 citation

Daniel Kreyling

Community comment on "The Simplified Chemistry-Dynamical Model (SCDM V1.0)" by Hao-Jhe Hong and Thomas Reichler, Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2021-149-CC1, 2021

Dear Authors,

we have a minor remark to your citation of the "Romanowsky et al., 2019" study.

We are developing the fast stratospheric ozone chemistry scheme (SWIFT) used in the study of Romanowsky et al., 2019.

In your introduction you state:

"Some modelling studies have already suggested a stronger stratosphere-troposphere interaction when interactive ozone is introduced in their simulations (Haase and Matthes, 2019; Li et al., 2016; Lin and Ming, 2021; Lin et al., 2017; Romanowsky et al., 2019), **but these studies were based on complex chemistry-climate models that have a large computational burden and are often difficult to understand.**"

We think, the SWIFT module can not be described as a "complex chemistry-climate" model.

Its intention is to be fast and numerically efficient, therefore it is not complex and has a very low computational burden.

SWIFT is coupled to GCMs for the same purpose as the Cariolle or Linoz schemes. In the current state of SWIFT, it only treats ozone and thus provides an interactive ozone layer to the GCM (e.g. replacing prescribed ozone from climatologies). So in our view it does not full fill the criteria to be a full "chemistry-climate model " which may include full stratospheric and trotpospheric chemistry.

For further information on the SWIFT model please refer to:

Wohltmann, I., R. Lehmann, and M. Rex. “Update of the Polar SWIFT Model for Polar Stratospheric Ozone Loss (Polar SWIFT Version 2).” Geosci. Model Dev. 10, no. 7 (July 13, 2017): 2671–89. https://doi.org/10.5194/gmd-10-2671-2017.

Kreyling, D., I. Wohltmann, R. Lehmann, and M. Rex. “The Extrapolar SWIFT Model (Version 1.0): Fast Stratospheric Ozone Chemistry for Global Climate Models.” Geosci. Model Dev. 11, no. 2 (March 1, 2018): 753–69.

https://doi.org/10.5194/gmd-11-753-2018.

Don't hesitate to write us if you have more questions (daniel.kreyling@awi.de).

Kind Regards, Daniel Kreyling