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Geoscientific Model Development Discussions

Interactive comment on "Update of the SWIFT model for polar stratospheric ozone loss (SWIFT version 2)" *by* Ingo Wohltmann et al.

Anonymous Referee #1

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Review for Wohltmann et al., "Update of the SWIFT model for polar stratospheric ozone loss (SWIFT version 2)", submitted to GMD

In this manuscript authors describe updates in the SWIFT-parametrization that is developed a computationally inexpensive scheme for determine stratospheric ozone depletion during polar winters. This scheme is intended for use in GCM and ESM's which do not have detailed (or better) representation of stratospheric ozone loss during polar nights. SWIFT parametrization is based on a set of coupled differential equations, which simulate the polar vortex averaged mixing ratios of the key 5 species involved in polar ozone depletion (O3, ClOx, HCl, ClONO2 and HNO3). External input parameters used in this scheme are the fraction of the polar vortex in sunlight and the fraction of the polar vortex below the temperatures necessary for the formation of PSCs. Here authors also present results from some key individual processes that are evaluated

against their ATLAS model as well as O3 and HCl are compared against MLS satellite data. Overall, this is clear and concise manuscript and fits well in GMD scope and I recommend this manuscript for the publication.

Minor corrections:

Page 1 Abstract- 1. Line 3- so far "some" climate 2. line 6: chemically reactive chlorine 3. line 10: single process or individual process 4. line 11: more or duplicating the message from previous sentence. delete or reword 5. line 13: I think "that closely" is better 6. line 15-16: Bit consuming. Reword 7. line 20: "detailed chemistry model ATLAS". 8. Line 25: delete "very"

Page 2: line 15: delete only or put it at end of the sentence. line 23-26: Very very long sentence- rewrite line 30: climate change more realistically. line 31: The latest

Page 3: Table 1: Typo "original"

Page 5: Line 3: change Wholtmann et al.,xxx) to Wholtmann et al.,in prep.) line 3: The present paper concentrates on the Line 17: Here the choice of pressure

Page 7: line 10: If not applied here and Wholtmann et al.,in prep. is not published. I don't think you need to add it here.

Page 8: line 15: give some indication where FAP & FAPs is more important (Arctic or Antarctic)

Figure 17-18: Improve the axis labels and plot titles

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