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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Role of oceanic ozone deposition in explaining short-term variability of Arctic surface ozone" *by* Johannes G. M. Barten et al.

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Thank you to the authors for presenting a very interesting study.

I would like to highlight one aspect of the paper where there appears to be an ambiguity. The authors have coupled the Coupled Ocean-Atmosphere Response Experiment Gas transfer algorithm (COAREG, version 3.6) to the regional WRF-Chem model. This model setup supposedly includes an improved (two-layer?) mechanistic scheme for the calculation of the waterside surface resistance term in computing ozone dry deposition to water, but the authors have not presented any equations/parameterisations that have been used for this term. They refer to the paper by Porter et al. (2020) for COAREG

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(version 3.6) and looking up this paper I do not see any application to ozone deposition there (only water vapor and sulphur dioxide are considered). Other papers are also cited but I do not think they relate to version 3.6.

Therefore, it is not clear what exact equations for the parameterisation of the water-side surface resistance term (and associated parameters such as iodide concentration in water, reaction rate constant and ozone solubility) for ozone deposition have been used, and there does not appear to be a source for finding these. It is will be useful for the authors to present these equations in the paper for the sake of completeness and clarity.

Reference

Porter, J., de Bruyn, W., Miller, S., and Saltzman, E.: Air/sea transfer of highly soluble gases over coastal waters, Geophysical Research Letters, 47, e2019GL085286. https://doi.org/10.1029/2019GL085286.

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