

# ***Interactive comment on “The E3SM version 1 Single Column Model” by Peter A. Bogenschutz et al.***

## **Anonymous Referee #1**

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The discussion paper by Bogenschutz et al. describes single-column model (SCM) of the E3SM, version 1 model. In my opinion, this discussion paper is very suitable for GMD, is well written and deserves publication as a full paper. Below, I have a few comments that I think the authors should address:

1. Could the authors briefly explain how the surface conditions are prescribed for the SCM, and describe the options that are available for the surface conditions?
2. Is there a plan to develop an ocean-atmosphere SCM for studying coupled atmosphere-ocean processes (e.g. Hartung et al., 2018), considering that the E3SM includes these components? Do authors have an opinion if such coupled SCM would be useful from the point of parameterization development?

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3. I really like a study of precipitation bias over the SGP and AMAZON sites and discussions about the representativeness of SCM model results for the three-dimensional model. Is there a way to predict this representativeness before conducting SCM experiments? I would naively think that comparing the dynamical and physical tendencies from the three-dimensional model could be a way to do this.

4. I think recent work by Smalley et al. (2019) on the SCM development and its use for parameterization testing and development deserves to be mentioned.

References:

- Hartung et al., 2018. An EC-Earth coupled atmosphere–ocean single-column model (AOSCM.v1\_EC-Earth3) for studying coupled marine and polar processes. GMD. doi: 10.5194/gmd-11-4117-2018

- Smalley et al., 2019. A Novel Framework for Evaluating and Improving Parameterized Subtropical Marine Boundary Layer Cloudiness. MWR. doi: 10.1175/MWR-D-18-0394.1

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