

Review of: Global Monsoon in ICON: The scale-dependent response of Northern Hemisphere Monsoons

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Review: The authors are examining the fidelity of the ICOSahedral Non-hydrostatic (ICON) model in simulating the hydroclimate of the various regional monsoons in the tropics. They use a 10 year atmosphere-only simulation forced with observed SST to assess the model simulation of the seasonal cycle, interannual, intraseasonal variations and extreme rain events.

Overall the paper is well written and the figures are of high quality. I consider this paper to be important as it is familiarizing the readers with a relatively new model on its performance of the monsoon. The paper is easy to read and understand and I would support its publication after the authors address the following comments:

1. At the tested spatial grid spacings of 80, 40, and 10 km I don't believe that the non-hydrostatic feature is important at all. So, my question then is what is the purpose of running an expensive feature like the non-hydrostatic option for this study at all?
2. The tracks of the low pressure systems in Fig. 12 suggest that the results in the paper are representative of the 10-year integration period (2006-16) of ICON or sensitive to the algorithm used to diagnose these systems. For instance, Vishnu et al. (2020; <https://doi.org/10.1029/2020JD032977>) also find a fair number of tracks going northward towards Bangladesh from northern head Bay of Bengal as opposed to just northwestward tracks. So could you comment on this?
3. If the authors wish to compare the results with a variety of precipitation observations then they should also summarize their merits and disadvantages.
4. It would be nice to show the topography represented at all three grid resolutions.
5. I would be curious to know if the partitioning of convective and stratiform precipitation changes across resolutions? Likewise does the fraction of high, medium, and low cloud cover change across resolutions for light, medium, and heavy rain events? Is there a difference in the precipitation efficiency and precipitation recycling ratio across resolutions?
6. The authors could provide more details on the models like what timesteps are used for the three models?