

Interactive comment on “Mesoscale simulations of tropical cyclone Enawo (March 2017) and its impact on TTL water vapor” by Damien Héron et al.

Anonymous Referee #1

Received and published: 18 November 2020

Review of “Mesoscale simulations of tropical cyclone Enawo (March 2017) and its impact on TTL water vapor” by D. Heron et al.

This paper is clear and well written. It provides a credible description of a convection-permitting model simulation of a tropical cyclone, including the overall structure, evolution, and precipitation. However, the focus of the paper is on quantifying the impact of TCs on stratospheric humidity. The comparison with CALIOP measurements shows that the simulated cloud has a factor of 10 too much ice above the tropopause. I cannot see the point in proceeding with using the simulation to quantify the humidification of the lower stratosphere; the estimate would obviously be excessive and unrealistic. Further, the extrapolation of results from a single, unrealistic simulation to the Southwest Indian Ocean (and even to the global tropics) is dubious. The resulting estimate has

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little quantitative value. The authors state that Enawo was not even representative of TCs in the SWIO region (it was apparently the strongest TC in the summer hemisphere for the 2016/2017 season). I fear readers will simply take the stratospheric hydration numbers (0.3–0.5 ppmv) as realistic estimates when they clearly are not. As a result, I do not think the paper should be published in ACP.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-870>, 2020.

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