

Interactive comment on “Evaluation of WRF-DART (ARW v.3.9.1.1 and DART manhattan release) multi-phase cloud water path assimilation for short-term solar irradiance forecasting in a tropical environment” by Frederik Kurzrock et al.

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Thank you very much for your positive comments on the manuscript.

The stated error reduction of 3-4 % refers to a mean over the 12 considered sites. The site-specific forecast error reduction varies from site to site as a result of Reunion Island’s complex topography and diverse microclimates. This circumstance is taken into account in the experiment evaluations in the manuscript, for example in the discussion of results for sites located on the coast or in the mountains. It is true that this

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aspect should be explained more clearly in the conclusions where we talk about the error reduction of 3-4 %. We therefore propose the following modification at page 15, line 2:

The evaluation of GHI forecasts from the experiments without and with DA shows an overall reduction of 4 % for RMSE and 3 % for MAE due to CWP DA on average over all sites. The method of refining the ICs using CWP DA causes a positive impact on GHI forecasts for the whole duration of the forecast, i.e. up to a lead time of 14 hours. As a consequence of the complex topography of Reunion Island and local thermal circulations, the highest forecast error reduction is achieved for sites located in the mountains and in the lee of the trade winds. Future experiments at higher model resolutions should take this circumstance into account and evaluate the link between the impact of satellite data assimilation and the model's capability to resolve thermally induced local clouds.

Kind regards,

Frederik Kurzrock on behalf of all co-authors

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