

Interactive comment on “Evaluation of coastal Antarctic precipitation in MAR3.9 regional and LMDz6 global atmospheric model with ground-based radar observations” by Florentin Lemonnier et al.

Anonymous Referee #3

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This is a weak paper that should be rejected as it will take a huge amount of work to rectify.

The key aspect to the precipitation profile in Figure 1 is the sublimation of the falling precipitation by the dry katabatic winds as described Grazioli et al. (2017b). I would have expected the output from MAR3.9 in the immediate vicinity of Dumont D’Urville to be fully exploited to examine the precipitation generation, the sublimation and their causes, namely the winds along and normal to the DD-Dome C transect, the temperature field, the relative humidity field, the sublimation profile, the vertical motion field,

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along with the precipitation profile. Then the differences with the control run could be explained in terms of these causes. I still don’t know why, in physical terms, there is the difference between the 5 km and 25 km domains, and what role(s) the simulated katabatic winds play. Is there pooling or blocking of the airflow? Where does the dry air pool come from in 5km BIG (Fig. 4, barely visible, where is the white contour)? Why focus on the monthly precipitation accumulation? What about the individual precipitation events? Etc.

Then there is the tuning exercise for LMDz6 for February 2017. The real test for the validity of this tuned precipitation prediction is to try it out for a month independent of the tuning.

Figure 8 is very challenging to discriminate between all the different lines, dashed, dotted, and solid, many of which are very similar.

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