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Disaggregation of precipitation in modelling the Antarctic ice sheet surface mass balance

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One dominant component of the Antarctic ice sheet surface mass balance is certainly snow precipitation, with the largest accumulation observed in the costal region. As orography plays a key role there, it has to be carefully represented in climate models, like MAR (Modèle Atmosphérique Régional). One solution could be to use a high horizontal resolution but long simulations would be quite expensive. Therefore, we propose an alternative approach that consists in applying a precipitation disaggregation model to low-resolution MAR output fields. The disaggregation model is developed by considering the impact of orography on the physical processes responsible for precipitation. A two-year simulation with MAR at 100 km is used to force our diagnostic model. The results are compared with snow measurements provided by the network of Antarctic Automatic Weather Stations.