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Atmospheric Measurement Techniques Discussions

Interactive comment on "Toward a variational assimilation of polarimetric radar observation in a convective scale NWP model" *by* Guillaume Thomas et al.

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Firstly, I wanted to aknowledge for you comments. They helped for the manuscript improvement.

Concerning your general remark, I added some lines to describe the currently operational observation operator in the AROME-France model. These modifications appear in the introduction and replace, in the previous version of the manuscript, the lines 47 to 51. The new version of these lines is:

"At Météo-France, a two-step method is operationally performed in the AROME-France

model (Wattrelot et al., 2014). Firstly, a radar observation operator, based on the Rayleigh's scattering theory, is used to simulate horizontal reflectivity whitin the model geometry. To do so, the same equation than the equation 1 described in Section 2.1.2 is used. This operator account for scattering by rainwater, snow, primary ice and graupel (Caumont et al., 2006). Then, an interpolation of ZHH onto the radar main lobe by a Gaussian function is performed. From simulated ZHH, pseudo-profiles of relative humidity are retrieved using a 1D Bayesian inversion (as described in Caumont et al. (2010)). In the second step, these pseudo-profiles are assimilated in a three-Dimensional Variational (3DVar) system. In this approach, the complex linearization of the reflectivity observation operator is avoided."

Finally, your technical comments have been taken into account in the new version of the manuscript.

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