

This article by Lukas Pfitzenmaier et al. presents the development and demonstration of an open-access simulator tailored for the CPR measurements of EarthCARE. The paper provides a novel way of comparing model results with observational satellite data, hence falls within the objectives of the GMD. The work is complete, scientifically accurate, and significant, and the manuscript is well-written and well-structured. Overall the study is suitable for publication. Certain sections could benefit from some additional clarifications, described herein.

L. 5-6: "*We demonstrate Orbital-Radar's ability to provide realistic CPR views of typical cloud and precipitation scenes.*" It would benefit the reader if you include in the abstract some additional information of the demonstration of the realistic CPR views provided in this work. Maybe through mentioning the applications presented in the paper? Also, you could consider including in the conclusion the need of additional evaluation of the performance of the tool with CPR measurements.

Lines 74-75: "If the input radar data are from a 35 GHz radar system, then, the technique described in Protat et al. (2010) is used to convert them to 94 GHz and the same dielectric constant ( $k = 0.75$ ) is used to estimate radar reflectivity ( $Z_e$ )." The dielectric constant  $|K^2|$  may vary in different conditions of temperature/ or different wavelengths of electromagnetic radiation (see Table 1 from Lhermitte 1989). Do you expect that using the same dielectric constant may have an impact on the results of the simulator? Also, please elaborate on the  $k=0.75$ , given that the dielectric factor used in radar meteorology is usually denoted as  $K^2$ .

L. 82: "*The gaseous attenuation is straightforward and requires only knowledge of the vertical profile of water vapour that can be retrieved from an atmospheric sounding (Liebe and Layton, 1987). Knowledge of the hydrometeor phase, mass, density, and number concentration is needed for the estimation of the hydrometeors attenuation. These microphysical parameters are not available from ground-based radar observations*". Can you provide additional comment on indicative cases with strongly attenuating conditions of clouds or rain where the tool phases limitations to simulate the CPR data?

L. 89: "*The core components of Orbital-Radar have been separately described.*" Can you clarify in the text if all these core components are used in the simulator?

Equation 1: Do you assume a uniform linear motion? I would suggest to elaborate a little on that.

L. 93: Please indicate that NUBF is the non-uniform beam filling. It is mentioned only in Fig 1 caption.

L. 131: typo  $W(x)$ .

Lines 126-144: The authors could consider including a brief description of the concept of a weighting function, (e.g. a mathematical example like the Gaussian form  $e^{-2x^2/(2\sigma^2)}$ ). This would help readers not very familiar with technical details, understand how the antenna gain and range weighting functions behave.