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Geoscientific Instrumentation Methods and Data Systems Discussions

Interactive comment on "The next generation airborne polarimetric Doppler weather radar" *by* J. Vivekanandan et al.

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The described concept would be a very valuable addition for the monitoring of many precipitation types, especially in extreme cases like hurricanes. The article could be published nearly in its current form once the following points are addressed. The given references are in the form page number , line number.

P8,22: C-band wavelength is in the order of 50 mm, W-band 3 mm, aerosol nuclei 0,05 mm How will the proposed C-band radar measurement contribute to the understanding of sub-mm aerosol effects in the cloud formation? Polarization measurements together with modeling can retrieve information about dimensions significantly below the wavelength, but we are talking about 3 orders of magnitude. Where do the authors see the

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lower limit for deriving PSD? See qualitative discussion in section 2.4

P9,18 Please state expected maximum horizontal and vertical coverage of a typical APAR flight. The text only states that the ceiling altitude would limit its ability, but not to which altitude.

P12,16: Timing figure would help to understand better the proposed scheme: single pulse width, Doppler pulse separation, polarization change, direction change, etc

P15,4/P22,8: What kind of pulse compression scheme is used in APAR? What is the estimated range resolution after decompression?

P20,21: Mention explicitly that the QC algorithm is applied only on ground, if this is the case. The text could be interpreted as if the algorithm is implemented already inside the aircraft before data downlink.

Table 1 and 2: Both tables should have exactly the same structure to make them comparable. There is no god reason to have most parameters either sorted in different order or omitted in one table compared to the other, e.g. pulse length and velocity resolution appear in table 2, not in table 1.

P8,4/8,11/P10,15: A general comment to the formulation “interaction of aerosol and clouds”: Aerosols influence the cloud formation and thereby determine the properties of the formed cloud like cloud droplet sizes and their amount. They do not “interact” with clouds. The presented statement is widely used but misleading. Condensation particles + condensed water vapor are aerosols! The current formulation may be kept if the authors so wish.

Typographic errors:

P5,5 no other instrument other »than«

p8,11: aerosol»s« and clouds

P12,27: will be collected only over »« restricted elevation angles.

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P20,27: can reduce the editing time »« 10 fold.

P22,8: uses »a« pulse compression scheme for

Comments to references:

P25,26: Wasn't the article Bringi, V. N., and Chandrasekar, V.: Polarimetric Doppler Weather Radar, Cambridge University Press, New York published in 2005, ISBN: 9780521019552 ?

P26,14: Houghton et al. Did you mean "Climate Change 2001: The Scientific Basis" Cambridge University Press, Cambridge, U.K., 2001 isbn: 9780521014953 The author list and subject match except for C.A. Johnson ?

P26,21: The ELDORA/ASTRAIA

P26,22: High resolution observations from ..

P26,22: B. Am. Meteorol. Soc., 77,

P26,28 Correct Science title is: Hurricane Intensity and Eyewall Replacement

P27,1: correct title seems to be: Modeling, Error Analysis,. . ... Transmit Radar. Part II: Experimental Data (delete "illustration")

P27,7: correct quotation seems to be J. Atmos. Ocean. Tech., 17, 585-594

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 4, 1, 2014.