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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The effect of reported high-velocity small raindrops on inferred drop size distributions and derived power laws" *by* H. Leijnse and R. Uijlenhoet

Anonymous Referee #2

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The paper by Leinse and Uihlenhoet is a well argued response to a recent paper by Montero-Martinez et al, who suggested that small drops with velocities much higher than expected from theory -due to the break up of fast falling big drops- may cause substantial errors in DSD analysis and retrievals. The present paper uses simulations to analyse the effects of the above phenomena on DSD retrieval from 3 kind of instruments (JWD, 2D video and Doppler radar), and the subsequent impact on the inferred relationships between Rainrate and variables measured by remote sensing (radar reflectivity Z, extinction in the micro-wave or optical domain). The authors demonstrate convincingly and quantitatively that the effects of small drops with high velocity is real but small compared to other sources of uncertainty in DSD retrieval. The paper is well

written and well illustrated and (almost) ready for publication. I would like to ask for 2 minor modifications : In table 1 and subsequently in the document, the authors should remind what the assumptions and physical model behind the distributions i, ii, iii and iv is. This would make the interpretation of the Figs 4 to 7 easier for the reader. In fig 4 to 7 , thicker lines would make the figures more clear. On fig 3 it doesn' seem obvious why the range (gray area) is situated above the red curve and not spread 'around it'. The author could explain a bit more in the text how the 'range' is to be interpretated.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 9121, 2010.