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# *Interactive comment on* "Effect of charges carried by atmospheric particles on radar power ratio" *by* Li Xie et al.

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Thank the referees very much for review our manuscript carefully, and many good suggestions for well presenting our work. And we also appreciate the chance very much to revise our manuscript. According the referees' comments, we revised our manuscript carefully. The main revisions are concluded as following, 1) We checked English writing and almost re-edited the whole text to reduce the English misuse; 2) We re-arranged the order of formulas (2)-(4) and (6) in Section 2 to make the text frequent. In order to make the readers easily follow and reproduce our results, we added formula (5) in the manuscript to show the Mie coefficient of neutral particle which is used to calculate the backscattering cross-section and extinction cross-section of a neutral particle, and we also gave the more complete the derivations of formulas, such as formulas

(7)-(8) to show the ratio of the received power to the transmitting power of a radar/lidar system, and formulas (10)-(11) to show the calculation of the particle number density based on the ratio of the received power to the transmitting power; 3) We added the calculated results of the radar/lidar power ratio of a single-size-distributed particulate system with different surface charge density carried on the particles as shown in Fig.2, which is different from the one of the lognormal system, though the charges carried on the particles make the radar power ratio increasing. 4) To introduce more previous work, we also added the calculated results of the backscattering cross-section of a single-size-distributed particulate system with different surface charge density carried on the particles as shown in insert figure of Fig.2, which is accordant with the one presented by Kocifaj et al, and they found that an increasing amount of charges on cloud droplets strengthens the backscattering of a radar wave; in addition, as pointed out by Chiou and Kiang, the conventional radar equation should be improved because of the earth curvature and the difference of the sand size profile, which is necessary, but we cannot consider in our work, and we also added a discussion about this in the revised manuscript to see lines 6-9, P9, in order to void the effect of the earth curvature on the radar power, we choose the detection range and particle number density refer to the ones used by Chiou and Kiang, to see line 20 of P4 and line 1 of P5. A more detailed revision is given in a document in author's changes in manuscript.

Please also note the supplement to this comment:
https://www.atmos-meas-tech-discuss.net/amt-2017-384/amt-2017-384-AC3-supplement.pdf

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-384, 2017.