

Interactive comment on “Dust observations with antenna measurements and its prospects for observations with Parker Solar Probe and Solar Orbiter” by Ingrid Mann et al.

Anonymous Referee #1

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Review Comment on manuscript angeo-2019-94 entitled ‘Dust observations with antenna measurements and its prospects for observations with Parker Solar Probe and Solar Orbiter’ by Mann et al.,

This paper surveys the spacecraft charging observations as the dust impact detector in the past and future projects. Some minor collections and additional information for the readers will be needed before publication.

L50. ‘The majority of fragments smaller than micrometers are pushed outward by radiation pressure and electromagnetic forces.’ Is this the theoretical expectation or is there any observed pieces of evidence?

C1

L 87. Fig (Fig. laboratory) -> Figure 2? Also, some text styles for figures are not set in the same format. Please check.

Chapter 5 (previous observations) This chapter summarizes the dust detection by the electric field antenna onboard different spacecraft and environment. While the author well surveys all the past dust observations, it would be helpful for future readers if the results were summarized according to the favorable electric field measurement for the dust detection of the different sizes.

L218. ‘STEREO is ... orbit the Sun at around 1 AU’ The unit of the orbital distances used in this chapter is sometimes AU and R_A for another time. I would suggest using only AU for easier comparison.

L208. ‘Panel (E) shows a case of even higher positive bias. All electrons are re-collected in this case. The signal has no electron (blue) part and it has no “pre-spikes” in this case.’ The color of the Figure 4E must be mistaken (blue->red?)

L276. ‘Once these effects were taken into consideration, the estimated near-Mars micron dust flux observed by MAVEN was found to be consistent with the interplanetary dust flux expected at Mars.’ Please cite the reference that shows this fact.

L315. ‘Figure 9 compares ...’ Please make the figure numbers in order in the text. Figure 9 comes before Figures 7 and 8.

L480. ‘Figure 13 shows estimated signals for impacts of 0.1-micrometer particles with speeds of 100 km/s for spacecraft at different distances from the Sun.’ Please cite the reference for figures 13 and 14.

L484. ‘With the same estimate, we find that for the particle size of 0.01 micrometer and speed 200 km/s the pulses are 485 about a factor of 100 to 1000 smaller.’ Is this signal difference due to the different sizes of dust? Does the signal become bigger for the higher speed with the same dust size? It would be helpful to put the result of this simulation as the bottom panel of Figure 13.

C2

L495. 'The Mercury Dust Monitor (MDM, Nogami et al. 2010) will in near future study the dust environment near Mercury at 0.31 to 0.47 AU from the Sun.' Bepi-Colombo/MMO has also electric field antennas (PWI).

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