

## ***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.***

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Main Comments: The paper collects much of the active literature into a review and the paper should be published but there are some details in the paper that needs to be straighten out first.

With out reading the paper the last two sentences in the abstract sounds contradictory and it is not clear what information is tried to be conveyed. For instance, dust impact momentum and spacecraft potential both effects the amplitude of the signal, hence it is unclear how to read the sentence. Secondly, the amount of charge production, is it as material is ejected/vaporized due to a higher EUV flux or that the dust impacts

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are different. And the last sentence do not seems to provide any information for the abstract, remove last sentence from the abstract.

The paper do not discuss the 'pre-spike'. With presenting Figure 4 it needs more discussion and potential a discussion about time scales so readers can easily understand the differences. And the paper also need to discuss the timescales of the signal with respect to AC vs DC data processing. Note all laboratory analysis referred to is AC processed.

When the paper discuss how to interpret the dust signal is need to be slightly cleaner on how the develop actually is occurring. For instance, as the ejecta/vapouration occurs, is the material leaving the spacecraft neutral and as the gas expanding it become charged resulting in currents between the cloud and the spacecraft. Or is the ejecta/vapouration already charged as it leaves the spacecraft surface resulting in currents between spacecraft and infinity.

The title of the paper, the paper started as a great review of electric field measure dust. But needed with saying and SPP and SO might see dust, period. The title is '...and its prospects for observations with...' The paper comes across with zero information of where, when and how the dust is expected to be located. When the data is analyzed if we see dust everywhere or see nothing how should that be used. The paper should either be a review article or it should provide information for future analysis. The title and abstract claims both are provided but only the first can be found in the body.

Detail comments on the text:

Page 2 line 37: typo around 'In addition'

Page 3 line 70: The first sentence has very limited with information in it. The second sentence talks about the cloud which is fine, but the first sentence is lacking of how the cloud is created.

Page 3 lie 87, typo the figure reference is wrong.

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Page 4 line 107-109: This sentence depends how the authors view when the particles where ionized. If the particles are ionized directly at the surface and have momentum to leave the surface then the sentence should be rephrase. If the charge particles are created at a distance from the surface then the charge of the spacecraft might not be important because the particle already have a momentum.

Page 5, line 136: ‘...in the volume of initially neutral vapouration.’ This needs to be tied back to the authors description of the first microseconds (initially ‘neutral vapour’ has not yet been mention in the paper).

Page 5 line 139: ‘The first part...’ is the pre-spike in many of the data. Make sure that it is clear that existing sentence is referring to the steps in Figure 3.

Page 7 line 204: one sentence discuss ‘pre-spike’ while the next sentence say ‘...change the polarity ...’ The ‘pre-spike’ do not change sight. Incorrectly stated.

Page 8 line 208: the spacecraft potential has -to first order - no effect on the pre-spike. Remove the work ‘pre-spike’ from this bullet.

Page 10 line 286: please discuss with the co-authors about why Wind that is normally measure as a double probe actually is an mono-pole explaining why the dust signatures are so easily to be observed.

Page 14 lines around 397-405: This section is clearly interesting the reviewer got lost in the sentences and did not get out the intended information. Please rephrase this section so it is more clearer to get the intended information out.

Page 14 line 404: The inference of sublimation of particles. There has been no discussion of and if all dust is made of what material. The discussion of sublimation needs tot be removed or need a separate paragraph so the reader can follow the authors understanding on the topic.

Page 15 line 413: the paper is about electric field instrument dust detection. Here it is stated the size of particle STEREO is observing. This needs to be explained why the

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authors is claiming this. Any discussion of size and origin of dust detected by electric field instrument in this paper needs to be clearly stated of how that information was gained (other instrument, assumption, signal amplitude ignoring spacecraft potential etc).

Page 15 line 425: ‘...properties...follows the variation in ...speed..’ What is the properties that is discussed, shape of the dust grains?

Page 15 line 428: Bad start of the paragraph. The reviewer has no understanding of that this paragraph is saying. Remove or rewrite.

Page 17 line 475-479: More discussion of the instrument electronics respond time and coupling to the plasma is needed here. The observe rise time is effected by the electronics.

Page 17 line 494 – 497: the paper is about electric field measurement, why has the MDM instrument been called out and not other dedicate dust detectors? Remove the paragraph, distracting the reader from the topic.

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Interactive comment on Ann. Geophys. Discuss., <https://doi.org/10.5194/angeo-2019-94>, 2019.

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