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Comment on gi-2021-17

Anonymous Referee #2

Referee comment on "Swarm Langmuir probes' data quality validation and future improvements" by Filomena Catapano et al., Geosci. Instrum. Method. Data Syst. Discuss., <https://doi.org/10.5194/gi-2021-17-RC2>, 2021

Swarm Langmuir Probes' data quality and future improvements

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Reviewer report

This paper addresses the validation of the Swarm Langmuir Probe (LP) measurements and of the derived plasma parameters.

This is a very interesting and useful paper that addresses a topic that was never addressed, to my knowledge, in such depth. The authors must be commended for the efforts made to improve and characterize the Swarm LP measurements and the derived parameters.

The Swarm LP data are already being extensively used by the ionospheric community, and it is clear that, when the derived plasma parameters will be fully validated and properly flagged when uncertain, the swarm data will be an excellent reference for Langmuir probe data validation. It would also facilitate further novel studies of the ionospheric processes.

My main concern in the validation approach is that the peculiar position of the LPs, close to the spacecraft skin (within 10 cm) does not address the limitation of the quality of the measurements, hence the validity of the derived parameters, due to the fact that the LPs are most likely immersed in the spacecraft plasma sheath. The same is true also for the interpretation of the FP measurements, although not a direct subject of this paper.

Regarding the title, I would suggest the following modifications:

Swarm Langmuir Probes' data quality **validation** and **plans for** future improvements

Detailed comments, including editorial suggestions, are written in the attached document.

Please also note the supplement to this comment:

<https://gi.copernicus.org/preprints/gi-2021-17/gi-2021-17-RC2-supplement.pdf>