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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Radiant measurement accuracy of micrometeors detected by the Arecibo 430 MHz dual-beam radar" *by* D. Janches et al.

Anonymous Referee #2

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General Comments: This paper is fairly clear and well-written, though there are some loose ends which are not well handled. The basic conclusion, that the meteors are restricted to a cone angle of about ˜15 degrees around the beam axis has been clearly made and is well-supported by the data. The method used is simple and straightforward and it seems to have been applied correctly.

Specific Questions: The first data which are presented (Fig 1) are still something of a puzzle by the end of the paper. In particular, it is not clear (to me at least) why the radar sees a bimodal distribution of meteor velocities when looking into the ecliptic direction, and the authors don't really shed any light on this. If I knew more about the orbital properties of meteors this might be clear to me - and maybe the authors regard it as being too elementary to explain. But I suspect that most readers of this journal will have no more knowledge of meteor dynamics than I do, so I would like to see the

reason for the bimodal distribution spelled out. The reasons for the differences between figures 1a, 1b and 1c should also be accounted for more clearly. The authors seem to think that there may be other reasons to account for this apart from the geometric selection effect, the demonstration of which is the main result in their paper. The part of the discussion which deals with this aspect should be more clearly worded. From the existing wording, it is not clear what the other possible mechanisms are, nor how important the authors expect them to be.

There is also another area of the discussion where a bit more detail would have been helpful. The authors make a good case that the only meteors reaching their observing altitude come from a particular range of cone angles. This means that meteors at other angles are ablated at higher altitude. They strongly imply (but do not say straight out) that material from these meteors might constitute the "missing mass" that would explain the inconsistency between estimates of the mass flux due to meteor ablation derived from meteor radars and from satellite observations. Only a few extra words would be needed to make this point explicitly and I think it would be worth doing if the authors really think that their results support such a claim.

Technical Corrections: The authors have already responded to an earlier request for some changes in the wording. However, a few other changes would also improve the paper:

Page 208: "between a few km/s to ˜70 km/s" could be "between a few km/s and ˜70 km/s" Page 209: "the 305m diameter radar beam". I presume that the beamwidth is altitude dependent. At what altitude does this beamwidth apply ? Page 210: state the difference between AST and UT Page 212: "between the 80 and 120 km of altitude" should be "between 80 and 120 km altitude" "their parameters are presented in Table 1" should be "their parameters are presented in Table 2" Page 214: "also helps explaining at some degree" should be "also helps explain to some degree" Page 215: The sentence beginning "However, the dependency of the hourly meteor rate..." needs to be re-worded and more information needs to be given to make clear (if possible)

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what the "additional characteristics of the dust distribution" might be, which could give rise to the observed behaviour.

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