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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Meteor velocity determination with plasma physics" *by* L. P. Dyrud et al.

L. P. Dyrud et al.

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Referee 1: Comment 1,

We have added the following paragraph to manuscript text.

"While this paper focuses on the variation of meteor instability altitude with velocity, this altitude range is theoretically effected by additional factors. Our calculations show that the actual altitudes of meteor instability should depend on trail composition. Different ion composition shifts the altitude of trail instability up and down by a few km, but does not effect the altitudinal extent of the trail, and therefore velocity measurements using only extent. We hope to further investigate this dependency on trail ion composition in the future. Additional meteoroid properties such as entry angle and mass do not significantly effect altitudinal extent except regarding how these parameters effect where ionization is created. The effect of this is discussed in the next paragraph."

Comment 2,

We have added the following paragraph to manuscript text.

"Finally, we note that these estimates assume that radar reflections occur when and where a meteor trail becomes plasma unstable and turbulent. It is possible that some radar wavelengths, especially UHF and shorter are not particularly Bragg reflective from trail instability and turbulence that perhaps peaks near 3-5 m \citep{Dyrud:Interpretation02}."

Comment 3,

Both Figures 3 and 4 show meteor trail instability altitude versus velocity which may be used by any reader of the paper to replicate this study.

Comment 4,

We recognize that diurnal velocity would be an excellent way to test this theory. However, the data set used for this study consisted of 2 days of data from Midnight-8:00 am. We looked at all the data, and received too few counts outside of the dawn sector to make statistically significant statements. The trend is there, we just do not feel comfortable reporting it without more counts.

Minor Comment.

1. Changed 2. We believe the doppler shift should relate to neutral wind. Not necessarily a 1 to 1 correlation, but that is why we use the word correspond.

3. Approximately "micro-gram" was added to qualify small

4. This publishing error should be corrected.

Referee 2:

Comments.

With regard to summarizing the instability, since it is derived in two other papers we

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feel it would be excessive to reproduce it here.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 1247, 2004.