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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aspect sensitivity of VHF echoes from field aligned irregularities in meteor trails and thin ionization layers" *by* Q. H. Zhou et al.

Anonymous Referee #1

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In this paper, the authors use a relatively simple model to gain intuition regarding radar observations of field aligned irregularities within meteor trails and in sporadic E layers. Given the vast body of meteor radar observations, papers such as this are an important contribution to the literature. Their principle conclusion regarding meteor echoes is that perpendicular to the magnetic field diffusion is not an important mechanism late in the meteor trail's development, and therefore even high altitude meteor trails can be used to measure diffusion. The authors also argue for the importance of considering off perpendicular to the magnetic field scattering when analyzing sporadic E data.

The numerical model is evaluated both for the meteor trail case and for the horizontal layer case for only the MU radar parameters. One weakness of this paper is that the

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geometry for more sensors was not considered. Given that the later part of the paper is trying to explain recent results for Arecibo, evaluating the models for the Arecibo geometry as well would have been more convincing.

The model considers only scatterers in the plane containing both the magnetic field and the echo direction. It appears that the only variation allowed in the model in time is the expansion of the field aligned irregularity along the field line due to diffusion. The conclusion that off perpendicular to B echo decaying characteristics can be used to measure the diffusion rate along B is really based on reasoning outside of the numerical model.

Hysell is misspelled in the text near 742-15.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 731, 2004.