

Ann. Geophys. Discuss., referee comment RC1
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Comment on angeo-2022-11

Anonymous Referee #1

Referee comment on "A technique for volumetric incoherent scatter radar analysis" by
Johann Stamm et al., Ann. Geophys. Discuss.,
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The paper is expanding on a technique published by Nicolls et al. (2014) by using physical constraints to measure the electric field from ion velocities measured from ISR. The technique seems reasonable and the authors show how the method will work through simulation examples.

The authors deal with the affects of the sensor e.g. finite beam width and range extent of the measurments within equation 10. There can be a time component to this as the plasma moves through the FOV it can move to different resolution voxels. The closest cross beam voxels at 100 km along the north south track are about 5 km. This can be similar to a blurring of the data. Will this result in a major change in the algorithm? I think for the most part it will just be an adjustment to the forward model but it may not be necessary as you're just measuring velocities and not intrinsic plasma parameters with this technique. Plus the physics based regularization might help mitigate this impact.