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Discussions

Interactive comment on "Ducting of incoherent scatter radar waves by field-aligned irregularities" *by* Michael T. Rietveld and Andrew Senior

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See response to referee#1 for common the common response and revised figures.

Specific responses to referee#2: L86: see above

L96: A reference to Bryers et al. 2013 has been added and the sentence expanded to compare with resonant heating by O-mode waves.

Figure 1. The red lines indicating HF on times have been converted to red bars and moved between the first and second panels nearer the time ticks and labels.

L145-179: We agree that a schematic diagram illustrating the raytracing geometry would be very helpful. We have modified Figs. 2 and 3 in orientation (swapped x

and y variables) and added shading to show the irregularity region and their parameters. A new Fig.4 shows a sketch of the geometry and two representative rays for the cases without and with irregularities, together with histograms at the top showing the distribution of rays from the transmitter arriving at 600 km. More details of the irregularity modelling are also added in the text (lines 197-207), including the equation describing the irregularities (new Eq.1). A new Fig.5 shows the merged old Figs.4 and 5 of the final distribution of rays arriving at the ground from the 600 km level for the two cases without and with irregularities.

L158-160: Actually, the assumed 100 m spacing is unnecessary and has been changed to tens of meters. For the ray-tracing it is just necessary that it is much longer than the radar wavelength The assumed value of the density depletion is in line with rocket measurements made at Arecibo and a reference has been added here to Kelley et al., 1995 as well as in the subsequent discussion in section 6.

We believe that we fixed all the technical errors in the manuscript.

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