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Atmospheric Measurement Techniques Discussions

Interactive comment on "WIRA-C: A compact 142-GHz-radiometer for continuous middle-atmospheric wind measurements" *by* Jonas Hagen et al.

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Comments on WIRA-C A very good paper on a neat little instrument my only comment is Why is the instrument limited to the middle-atmosphere winds? At night there is ozone at altitudes above 75 km. The wind velocity at night has been measured using the 11.072 GHz line. See

Rogers, A.E.E., Erickson, P., Goncharenko, L.P., Alam O.B., Kerr, R. B., and Kapali, S. 2016, "Seasonal and Local Solar Time Variation of the Meridional Wind at 95 km from Observations of the 11.072 GHz Ozone line and 557.7 nm Oxygen line," J. Atmos. Ocean. Technol., 33, pp. 1355–1361. doi:10.1175/JTECH-D-15-0247.1

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Discussion paper

If I use the model atmosphere given in appendix of

Rogers, A.E.E., Erickson, P., Fish, V.L., Kitteredge, J., Danford, S., Marr, J.M., Arndt, M.B., Sarabia, J., Costa D., May, S.K. 2012, "Repeatability of the Seasonal Variations of Ozone near the Mesopause from Observations for the 11.072-GHz Line," Journal of Atmospheric and Oceanic Technology, 29, pp. 1492–1504. doi: http://dx.doi.org/10.1175/JTECH-D-11-00193.1

with line intensity at 300 K changed from -6.9997 to -4.15 and frequency changed from 11.072 GHz to 142 GHz and ozone concentration and temperature vs altitude of:

Altitude= 30 - 75 km concentration= 0.6 ppmv temp= 290 K

Gaussian centered at 95 km FWHM 10 km concentration= 10 ppmv temp= 190 K

I find that the difference in line shape (as in Figure 9) between eastward and westward at 10 degrees elevation is almost equally sensitive to to the ozone at 95 km as it is to the ozone at 70 km. While it may not be possible to separate the velocity at 70 and 95 km because at 142 GHz the line width due to the Doppler shift at 70 km is similar to that due to the pressure broadening. I find that at night the WIRA-C results could be influenced by the ozone at 95 km and the authors might want to comment

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