Generation mechanism of the high-latitude F-region irregularities: HF radar observation

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Statistical analyses are made of the parameters (echo power, Doppler velocity and spectral width) obtained with the Syowa East HF radar. Our previous study found positive correlation between the echo power and Doppler velocity. This relationship might suggest that F region irregularities are mainly generated by the ExB instability. This correlation becomes poor in the afternoon and midnight sectors. The latest results are; 1) positive correlation between the echo power and Doppler velocity is clear among echoes with large Doppler spectral width. 2) The correlation is poor among echoes with small spectral width. These characteristics can be explained in terms of the non-uniform component of plasma flows affecting the relative velocity between plasma flows and newtral winds.