



The non-Gaussian nature of ionospheric vorticity fluctuations

G. Chisham, M.P. Freeman, and G.A. Abel

British Antarctic Survey, Cambridge, U.K.

Using a new technique to determine ionospheric vorticity from line-of-sight velocity measurements made by the SuperDARN HF radars, we have determined statistical distributions of vorticity using 6 years (2000-2005) of measurements from 2 SuperDARN radars in the northern hemisphere. Ionospheric vorticity represents a good proxy for field-aligned current. The measured vorticity distributions are distinctly non-Gaussian, being leptokurtic with very heavy tails. By taking the moments of these distributions we have determined that there are distinct variations of the distributions with both AACGM latitude and the measurement scale size. These two factors can be deconvolved to study the scaling of vorticity, and hence of field-aligned currents, in the polar ionosphere.