

A comparison of ionospheric convection derived from SuperDARN and DMSP measurements

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Plasma convection in the high-latitude ionosphere plays a key role in describing the coupling processes between the solar wind and the magnetosphere-ionosphere system. A variety of instruments have been used to measure plasma convection in the past. Along with the expansion of SuperDARN, plasma convection derived from SuperDARN HF coherent radars have been utilized more and more in various space science studies. There is a necessity to investigate the consistency of convection data provided by SuperDARN and other observation systems, especially when multi-instrument simultaneous observations are applied for a specific scientific objective. A number of studies on this issue have been done by making comparisons of convection measurements between SuperDARN and other observation systems. Most of these studies considered the SuperDARN line-of-sight velocities, no systematic inter-comparisons with regard to the convection vectors have been reported so far. In the present study, SuperDARN-derived convection vectors are compared with DMSP-derived ion drift vectors in the plane perpendicular to the local magnetic field, where the latter were obtained by applying coordinate transform with IGRF 2000 model. The result shows an overall reasonable agreement between the two data sets. The degree of agreement is investigated with respect to the distance of SuperDARN measurements, IMF Bz component and magnetic local time.