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Mapping Cusp Dynamics from Ground and Satellites

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The Cusp is often considered the first entry region for electric and magnetic disturbances propagating with the solar wind towards the Earth resulting in the varying large-scale polar ionospheric convection and a host of small-scale ionospheric disturbances. With the present abundance of high-quality geomagnetic recordings and various types of radar observations now available in the polar cap around the anticipated ionospheric cusp position and with the fleet of low-altitude polar orbiting satellites conducting precision magnetic observations it is now possible to investigate cusp dynamics in more detail than ever before.

The presentation will illustrate the large-scale polar ionospheric convection under steady interplanetary conditions as well as the convection changes occurring during systematic changes in the interplanetary magnetic field (IMF) and the solar wind density and speed. Special emphasis will be given to the IMF By-related large-scale and small-scale field-aligned currents in the Cusp region and to the relations between the IMF, the variable large-scale field-aligned current system and the changing ionospheric convection patterns associated with convection disturbances progressing poleward from the Cusp region.