

Comparative study of high latitude dynamics from the Sondrestrom ISR and the EISCAT Svalbard Radar IPY runs

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The Sondrestrom Incoherent Scatter Radar is located at the west coast of Greenland at 67°N, 309°E, at about 74°N invariant latitude. This is under a highly variable region of the upper polar ionosphere, covering the polar cap, the polar cusp and the northward edge of the auroral zone. Throughout the International Polar Year (IPY) the Sondrestrom ISR is participating in a biweekly ~30 hours operational mode together with all the other high latitude ISRs in an effort to better understand the global features of the high latitude ionospheric plasma.

The EISCAT Svalbard Radar (ESR) is located outside Longyearbyen on Svalbard at 78°N, 16°E. Due to the geomagnetic geometry, the invariant latitude of the ESR is at 75°N, very close to that of Sondrestrom although more than 11° further north and 67° further east geographically. The relative location of the two radars result in interesting similarities and differences between the data obtained simultaneously at the two sites. While magnetic noon on Sondrestrom occurs in the early afternoon ~14:00 UT time, magnetic noon at the ESR location falls in the morning ~09:00 UT time. The relative amount of solar UV affecting the ionosphere above the two radars also vary throughout the year because of the relatively large geographic latitudinal difference.

In this paper we present a study of the variation of the global state of the very high latitude plasma state through a comparative study of the E and F region parameters obtained from the Sondrestrom ISR and the ESR at different times of day and for different seasons. We will look at the relative importance of the offset in time (UT relative to MLT), and the offset in geographic latitude at different seasons.