

PREBREAKUP EVENTS IN AURORAS AND EISCAT RADAR DATA.

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The results of coordinate EISCAT and TV camera observations of the prebreakup events on 15 November 1993 are discussed. Three interesting geophysical events might be studied with the EISCAT radar and TV camera during the period under consideration: pseudobreakup; plasma depletion on the polar edge of the southward drifting aurora arc and westward traveling surge. It was found that the short-time brightening of the weak zenith arc (pseudobreakup) was accompanied by the fading of the equatorial arc and, vice versa, the fading and disappearance of the zenith arc was accompanied by the equatorial arc intensification. The plasma cavity in the E region of ionosphere was detected by EISCAT radar on the poleward edge of the zenith arc after its passing through the radar viewpoint. The plasma depletion was associated with the enhancement of ion (at the altitudes of 150-200 km) and some elevation of electron (in E region) temperatures. Although the temperatures enhancement takes place on the both edges of the arc, the plasma cavity was observed only on the poleward edge. We estimate the width of the cavity to be about of 40 km. During the interval of the cavity observation the electric field in the E-region was extremely large (approximately 150 mV/m). It was observed also the significant increase of ion and electron temperatures one or two minutes before the arrival of westward travelling surge to the radar viewpoint. We interpret this as the existence of extended area of enhanced electric field ahead the WTS.