



Statistical properties of ionospheric density depletions at the boundary of auroral precipitation: EISCAT observations

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Ionospheric electron density depletions are often observed at the boundaries of auroral precipitation. Previous investigations suggest that these depletions, known also as auroral density cavities, are associated with a downward field-aligned current (FAC) region within the localized auroral current system. While precipitating electrons carry an upward FAC, the density depletions have been explained to be created by upgoing ionospheric electrons carrying the downward FAC. Enhanced perpendicular ionospheric electric fields are suggested to the FAC closure and they have been observed to be associated with the depletions. In this investigation, we use field-aligned measurements from the EISCAT UHF incoherent scatter radar from the years 2001-2011 to statistically study ionospheric density depletion events associated with auroral precipitation. We investigate the occurrence of the density depletions and study their dependence on geomagnetic activity as well as their general statistical properties.