



One hour of Natural Enhanced Ion Acoustic Lines in the Cleft/Cusp: A Multi-Instrumented Study

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Abstract

In this paper we present multi-instrument observations of Natural Enhanced Ion Acoustic Lines (NEIALs) observed by the EISCAT Svalbard Radar (ESR). For the first time, long sequences of NEIALs are found, with more than 50 events observed within an hour, ranging from 6.4 to 140 seconds in duration. The events of interest take place between ~08:45-10:00 UT, 22 January 2004. In this study, we combine ESR data with MSP observations of auroral emissions at 557.7, 630.0, 427.8 and 844.6 nm, as well as magnetometer and riometer observations of the magnetic deviations and radio absorption, respectively. The large numbers of observed NEIALs together with multiple instrument observations give an unique opportunity to study the details in the particle precipitation associated with these events. Previously, NEIALs have been associated with soft particle precipitation, red auroral arcs and dynamic rayed aurora. In this paper the 630.0/427.8 ratio is found to be much greater in the absence of NEIAL occurrences compared to instances where NEIALs occurred. Hence, a relevant discussion of particle flux and characteristic energies are given. Furthermore, observed NEIAL events are associated with increased riometer absorption, indicating that most of the time NEIALs are accompanied with high energy precipitation.