# High Energy Particle Precipitation in Relation to Naturally Enhanced Ion Acoustic Lines

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## Abstract

Naturally Enhanced Ion Acoustic Lines (NEIALs) observed with the EISCAT incoherent scatter radars on Svalbard and on the Scandinavian mainland are thought to be associated with soft particle precipitation. However, resent studies show that NEIAL events are also accompanied by particle precipitation of higher energies. Most events previously published have been isolated and very short lived ($<$ 20s). In this study, long sequences of NEAIL events were found frequently during the time period $\sim$08:45-10:00 UT on 22 January 2004, ranging from 6.4 to 140 seconds in duration. The events of interest take place after a halo Coronal Mass Ejections (CME) and increased riometer absorption was found during the time of interest. It is therefore believed that, for this case study, high energy particle precipitation may play an important role in the generation process of NEIALs. In this paper, the relationship between these issues is investigated by combining the result from the EISCAT Svalbard Radar (ESR) with other instruments.