



Determination of the chorus source region localization in the outer magnetosphere of the Earth using THEMIS measurements

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Discrete ELF/VLF chorus emissions are the most intense electromagnetic plasma waves observed in the radiation belts and in the outer magnetosphere of the Earth. They are supposed to propagate from the localized source region in the vicinity of the magnetic equator towards magnetic poles roughly along the magnetic field lines. The THEMIS project Electric Field Instrument (EFI) and Search Coil Magnetometer (SCM) measurements were used to determine the spatial scale of the chorus source localization region in the day side of the outer magnetosphere of the Earth. We present simultaneous observations of the same chorus elements registered onboard several THEMIS spacecraft in 2007 when all the spacecraft were on the same orbit. We also performed a case study of discrete chorus emissions captured simultaneously by four THEMIS spacecraft. The discrete chorus elements were observed in the frequency range 0.15 - 0.25 of the local electron gyrofrequency that is typical for the outer magnetosphere. We evaluated the Poynting flux and wave vector distribution and have quasi parallel propagation to the local magnetic field. The amplitude and phase correlation analysis of data allowed us to estimate the characteristic spatial correlation scale transversal to the local magnetic field to be in the range of 2800 – 3200 km.