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Source region of the dayside whistler-mode chorus

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Intense whistler-mode waves can be generated by cyclotron interactions with anisotropic electrons at energies between a few and tens of keV. It has been shown that whistler-mode waves propagating in the Earth's magnetosphere can influence relativistic electrons in the outer Van Allen radiation belt. These electromagnetic wave emissions are therefore receiving increased attention for their possible role in coupling electron populations at lower energies to the electron radiation belt.

Whistler-mode chorus emissions are known for their predominant occurrence in the dawnside and dayside magnetosphere. While it is generally accepted that dawnside chorus is excited by injected anisotropic plasma sheet electrons, the details of this process are still debated. Especially, possible mechanisms describing the origin of the dayside chorus are a subject of active research, including the role of the plasma density variations, and the role of a particular dayside configuration of the compressed Earth's magnetic field.

We use data collected by the Cluster mission during the last few years, when the orbit of the Cluster spacecraft reached to larger radial distances from the Earth in the dayside low-latitude region. We analyze multipoint measurements of the WBD and STAFF-SA instruments. We investigate propagation and spectral properties of the observed whistler-mode waves. We concentrate our analysis on the properties of the chorus source and we show that the dayside magnetic field topology can lead to a displacement of the source region from the dipole equator to higher latitudes.