



## Concentrated generator regions in the auroral magnetosphere as derived from conjugated Cluster and FAST data

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In September 2001 the orbital planes of the Cluster fleet (apogee at  $\sim 18R_E$ , orbital period 57 h) and the FAST satellite (apogee at  $\sim 4000$ km, orbital period 133 min) were close to each other. This allowed for several few hours events, consisting of sequences of conjunctions. In this paper we study such an event, by investigating the sign of the power density,  $\mathbf{E} \cdot \mathbf{J}$ , derived from the Cluster data. With its four spacecraft, Cluster is the first mission that allows for a complete evaluation of the current density,  $\mathbf{J}$ . In addition, we use estimates of the electric field,  $\mathbf{E}$ , from two different instruments, which improves the reliability of our data.

The power density profile shows a few concentrated generator (CG) regions, with significant  $\mathbf{E} \cdot \mathbf{J} < 0$ , alternating with extended generator (EG) or load regions, where  $\mathbf{E} \cdot \mathbf{J}$  differs from 0 only marginally. It is difficult to say whether the EG regions are real, since the measured signals are close to the instrumental detection limit. However, observations of accelerated electrons in the conjugated FAST data suggest that the CG regions are real.