



Current systems associated with Non-Conjugate Aurora

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The main goal of the present study is twofold. First, we want to develop a solid method for identifying the field aligned currents related to the specific non-conjugate auroral features identified by Reistad et al. (2013) and Laundal et al. (2010). Secondly, by utilizing this method we explore the idea that the non-conjugate aurora can be explained by asymmetries in the field aligned current system in the two hemispheres (Østgaard and Laundal, 2012). By transforming ground magnetometer measurements from the SuperMAG network in both hemispheres to the coordinate system used by the VIS Earth and WIC cameras onboard the Polar and IMAGE satellites, we combine the two datasets. We present four non-conjugate auroral events where a current system associated with the observed aurora and the ground magnetometer measurements can be postulated. For two out of four events we can identify signatures attributed to asymmetric field aligned currents. Three factors stand out as important for the identification of these; the position of the ground magnetometer station in relation to the non-conjugate auroral feature, the spatial extension of the feature and its intensity compared to surrounding auroral features.