



Characteristics of DC electric fields at dipolarization fronts

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We investigate the characteristics of DC electric field at dipolarization fronts and BBF's using multi-point Cluster observations. There are plenty of important issues that are considered, such as what kind of DC electric fields exist in such events and what are their spatial scales. One can also recognize if electrons and ions perform ExB drift motions in these events. To investigate this, we take an advantage of five different DC electric field measurements in the plasma sheet available from the EFW double probe experiment, EDI electron drift instrument, CODIF and HIA ion spectrometers, and PEACE electron spectrometer. The calibrated observations of the three spectrometers are used to determine the proton and electron drift velocity and furthermore the DC electric field, assuming that the electron and proton velocity perpendicular to the magnetic field is dominated by the ExB drift motion. Naturally when ions and electrons do not perform a proper drift motion, which can happen in the plasma sheet, the estimated DC electric field from ion and electron motion is not correct. However, surprisingly often the DC electric fields estimated from electron and ion motions are identical suggesting that this field is a real DC electric field around the measurement point. This investigation also helps understand how well different measurements are calibrated.