

## Geomagnetic conjugate observations of plasma sheet electrons by the FAST and THEMIS satellites

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To elucidate the relation between precipitating electrons at auroral altitudes and their magnetospheric source region, we analyzed electron spectra simultaneously observed by the FAST satellite at altitudes of 2500 - 3500km and by the THEMIS satellite in the plasma sheet at 7-13Re for three geomagnetic conjunction events. All three events were occurred during magnetically quiet conditions (AE, 0-50nT). We investigated the spectral shapes and energy fluxes of electrons for all the events, and the electron density and temperature for the first and third events by fitting the Maxwellian distribution function. To consider ambiguity of field-line mapping, we investigated the FAST data  $\pm 30$ sec from the preliminary conjugate time. Time resolutions of the FAST and THEMIS electron measurements are 1-3sec and 1-7min, respectively. For the first event at 19:15:00( $\pm 30$ sec) UT on 10 April 2008, electron energy flux obtained by FAST is significantly lower than that of THEMIS at the estimated conjugate time (19:15:20 UT based on the T89 model). However, the electron spectrum in perpendicular pitch angle at FAST is well correlated with the spectrum in parallel pitch angle at THEMIS for an energy range of 0.3-4keV at 19:14:30 UT, which is 50sec before from the estimated conjugate time. The higher energy electrons (5keV  $\sim$ ) are continuously missing at FAST for all the time range at 19:14:30-19:15:30 UT. The density and temperature at FAST are smaller than those of THEMIS. For the second event at 12:55:00( $\pm 30$ sec) UT on 26 April 2008, the electron spectral shape in perpendicular pitch angle at FAST is well consistent with that of parallel pitch angle at THEMIS at estimated conjugate time at 12:55:10 UT. For the third event at 00:58:00( $\pm 30$ sec) UT on 25 December 2008, uniformly precipitating high-energy electrons (300eV  $\sim$ ) and low-energy inverted-V shape electrons ( $\sim 300$ eV) with monoenergetic peak at 100-200eV were observed simultaneously at FAST at the estimated conjugate time at 00:58:00 UT. We found that the spectral shape of the high-energy electrons in perpendicular pitch angle at FAST is very well correlated with that of parallel pitch angle at THEMIS. The low-energy electrons with monoenergetic peak at FAST are not seen in the THEMIS electron spectrum. The density and temperature at FAST are comparable to those at THEMIS for the high energy electrons. From these initial results, we suggest that the non-accelerated precipitating electrons at auroral altitudes directly come from the equatorial plasma sheet, except for the high-energy part of event 1.