



## Radial profile of magnetic field in earth magnetotail current sheet

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Knowing the magnetic field distribution in the magnetotail current sheet (CS) is essential for exploring magnetotail dynamics. In this study, using a joint dataset of Cluster/TC-1, the radial profile of the magnetic field in the magnetotail CS with radial distances covering  $8 < r < 20$  RE under different geomagnetic activity states (i.e.  $AE \leq 100$  nT for quiet intervals while  $AE > 100$  nT for active times) and solar wind parameters are statistically surveyed. Our new findings demonstrate that, independent of the activity state, the field strength and Bz component (GSM coordinates) start the monotonous increase prominently as r decreases down to  $\sim 11.5$  RE, which means the dipole field starts to make a significant contribution from there. At least in the surveyed radial range, the Bz component is found to be weaker in the midnight sector and at the dusk flank than that at the dawn flank, displaying a dawn-dusk asymmetry. The occurrence rate of negative Bz during active times also exhibits a similar asymmetric distribution, which implies active dynamics may occur more frequently at midnight and dusk flank. In contrast to quiet intervals, several features can be seen during active times: (1) a local Bz minimum between  $10.5 < r < 12.5$  RE is found in the dusk region, (2) the Bz component around the midnight region is generally stronger and experiences larger fluctuations, and (3) a sharp positive/negative-excursion of the By component occurs at the dawn/dusk flank regions inside  $r < 10$  RE. The response to solar wind parameters revealed that the Bz component is generally stronger under higher dynamic pressure ( $P_{dy} > 5$  nPa), which may support the dawn-dusk squeezeing effect presented in the case study of Miyashita et al. [2010]. The CS By is generally correlated with the interplanetary magnetic field (IMF) By component, but the correlation is better with higher penetration coefficient (the ratio of CS By to IMF By) when IMF Bz is positive. The implications of the present results are discussed.