

Estimate of the magnetotail current contribution to Dst

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The magnetic field of the magnetotail current is curl-free in the dayside magnetosphere and can be found from the solution of the Neumann boundary problem. The dayside magnetopause and plane $x = 0$ separating the dayside and nightside regions of the magnetosphere were chosen as the boundaries. At the magnetopause the normal magnetic component is equal to zero. On the plane $x = 0$ we took the normal component $B_x(y,z)$ from observations [Ostapenko and Maltsev, JGR, 2000, V.105, 311]. The ring current yields the zero normal component on the plane $x = 0$ so that $B_x(x=0,y,z)$ is produced by the magnetotail and magnetopause currents. The effect of the magnetopause current can be excluded with the use of the Mead [1964] model. The calculations show that the tail current yields more than 60% contribution to Dst.