MAGNETOTAIL TRANSIENTS AND THEIR ROLE IN ENERGY AND FLUX TRANSPORT IN THE MAGNETOSPHERE

A. Runov[1]

[1] *University of California Los Angeles*

The flowing solar wind transporting the interplanetary magnetic field is the source of energy input into the magnetosphere. Magnetic reconnection is the main coupling mechanism between the solar wind and the magnetosphere. On long-term average, the magnetic flux, reconnected on the magnetopause, is transported toward the magnetotail where magnetic energy is converted into the kinetic energy of plasma via magnetotail reconnection. Magnetotail reconnection results in partial release of the magnetic flux into space in the form of a plasmoid on the night side and partial return of the flux to day side that completes the so-called Dungey cycle. The Dungey cycle time in the Earth's magnetosphere is $\sim$1 hr. Decades of *in-situ* observations have revealed that many magnetotail phenomena have characteristic temporal scales from a few seconds to $\sim$1 min, i.e, 2 - 3 orders of magnitude smaller than the Dungey cycle and that these transient phenomena play the key role in the energy, magnetic and particle fluxes transport in the magnetotail. Recent observations by THEMIS and ARTEMIS provided new insights into energy conversion and transport in the magnetotail. This paper aims to summarize the present knowledge on magnetotail transients, their role in energy, flux, and particle transport from the magnetotail towards the inner magnetosphere.