



## **Particle energization by substorm dipolarizations**

Konstantin Kabin (1), German Kalugin (1), Eric Donovan (2), and Emma Spanswick (2)

(1) Royal Military College of Canada, Department of Physics, Kingston, Canada, (2) University of Calgary, Department of Physics and Astronomy, Calgary, Canada

Increased fluxes of energetic electrons and ions in the inner magnetosphere are often associated with substorm dipolarizations. We discuss a new conceptual model of the electric and magnetic fields in the tail which has only a few easily controlled adjustable parameters, such as the thickness and the earthward extent of the cross-tail current sheet. The model is two dimensional in the meridional plane and its application is restricted to a certain azimuthal sector (typically, 30 degree wide) around the midnight. We consider a substorm dipolarization to be a tailward retreat of the current sheet during which the size of the area threaded by the dipole-like magnetic field around the Earth increases. The calculated fields are used to describe the motion of electrons and ions and changes in their energies. In some cases, energies of the particles increase by a factor of 25, which is, sufficient to explain observations of energetic particle injections at the geostationary orbit as well as some ionospheric observations, for example, those carried out by riometers. Therefore, we consider our scenario of the dipolarization process to be feasible.