

EFFECTS OF COROTATION ELECTRIC FIELD ON THE DYNAMIC
OF ENERGETIC PARTICLES IN AN ASYMMETRIC
PLANETARY MAGNETIC FIELD

by

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ABSTRACT

The effects of the corotation electric field on the dynamics of energetic particles in the inner magnetosphere of the Earth and Jupiter is investigated, using the concept of drift paths of constant effective potential and assuming that the plasma particles corotate rigidly with the planet. We restrict the study to equatorial particles and also assume that, in both planets, the magnetic field in the inner magnetosphere can be well described by an eccentric dipole model. We found that several different types of trajectories do occur, going from those encircling the planet to those restricted to a given longitude sector, this behavior being dependent of the charge (electron or proton) and energy (10 KeV to 1 MeV for Earth and 1 MeV to 1 KeV for Jupiter) of the particles. These results are discussed in the context of the possible implications on the morphology of the particle precipitation.