



0.0.1 The Effect of a Southward Magnetic Field Component on Störmer's Allowed Regions, and on the Entry of Solar Energetic Particles into the Magnetosphere

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0.0.5 The motion and penetration of charged particles in a magnetic dipole has first been studied by Störmer. The Störmer's theory has been extended by adding a magnetic field whose orientation is either parallel or anti-parallel to the geomagnetic dipole moment. I have derived an expanded expression for the Störmer potential taking into account additional IMF or Ring Current magnetic field components. I will illustrate how Störmer's allowed and forbidden zones are changed by the implementation of a southward B-field component. It will be shown that increasing the southward magnetic field component opens the way for Solar Energetic Particle to flood the geomagnetic field and repopulate the outer drift shells of the Radiation Belts. The penetration depth and the energy threshold of the invading ions and electrons is mainly controlled by the intensity of the superimposed southward B-field component. The rate of injection of Solar Energetic Particles into the inner Störmer zone is modulated by the intensity of the interplanetary convection electric field, and depends also on the phase space densities of the energetic particles outside and inside the geomagnetic cavity.