

The Impact of Trapped Radiation on Natural Satellites Imbedded in Planetary Magnetospheres

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Multiple spacecraft encounters with the magnetospheric regions surrounding the gaseous giants in our solar system have shown time and spatial variations in the durably trapped particle population and the magnetic field itself. Many of the proposed mechanisms for these variations involve the interaction of the ambient medium with the natural satellites imbedded in the magnetosphere. Several studies have been made of this interaction, with varying degrees of success, but few have combined all of the complexities which the problem has required. Data taken by Voyager 1 during its flyby of Europa's orbit is used as a case study in the complications of traditional approaches. A means of resolving some of these difficulties is presented. A method for tracing particles from their observation point by the spacecraft is used to explain some of the energy and pitch angle dependencies of the Voyager 1 observations.