

TRAJECTORIES OF IONS SPECULARLY REFLECTED FROM NON-PLANAR COLLISIONLESS SHOCKS

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An important contribution to the thermalization of the solar wind ions at the Earth's bow shock for high Mach numbers comes from the reflection of a fraction of these ions from the surface of the shock. Previous studies have examined the trajectories of the reflected ions assuming the shock to be an infinite plane. In this paper a model is developed to describe the trajectories of particles after reflection for a variety of shock surface geometries. Of particular interest are the initial conditions which allow the particle to return to the shock with a greater normal velocity than at first encounter, or to return to the shock at all. Results on the effect of the magnetic field direction and the curvature of the shock are discussed for cylindrical, spherical, and parabolic shock geometries and compared to those for a planar shock.