DYNAMICS OF PARTICLES WITH HIGH INITIAL TRANSVERSE VELOCITIES IN A MAGNETIC FIELD WITH CUSP GEOMETRY

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S u m m a r y

The motion of charged particles with high initial transverse energies ($E_\perp \sim E_\parallel$) injected into a region occupied by a magnetic field with cusp geometry has been studied numerically. The dependence of the particle penetration depth on the initial conditions and the criterion for a particle to pass through the system are obtained. It is shown that the particles with the same initial transverse energy can either pass through the system or be reflected, depending on the ratio between their initial radial and azimuthal velocities. Some parameters of the particle flow – in particular, the particle velocity, the radial displacement of particles with respect to the starting radius, and the flow direction – at the system center, where the magnetic field vanishes, and their dependences on the initial radial velocity are analyzed. Possible applications of the results of studies are discussed.