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3D Kinetic Simulation of Plasma Jet Penetration in Magnetic Field[1] SERGEI A. GALKIN, I.N. BOGATU, J.S. KIM, Far-Tech, Inc. — A high velocity plasmoid penetration through a magnetic barrier is a problem of a great experimental and theoretical interest. Our LSP PIC code 3D fully kinetic numerical simulations of high density (10^{16} cm^{-3}) high velocity (30-140 km/sec) plasma jet/bullet, penetrating through the transversal magnetic field, demonstrate three different regimes: reflection by field, penetration by magnetic field expulsion and penetration by magnetic self-polarization. The behavior depends on plasma jet parameters and its composition: hydrogen, carbon (A=12) and C_{60}-fullerene (A=720) plasmas were investigated. The 3D simulation of two plasmoid head-on injections along uniform magnetic field lines is analyzed. Mini rail plasma gun (accelerator) modeling is also presented and discussed.

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