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Progress in High-Energy-Density Plasma Jet Theoretical Research[1] CHIPING CHEN, JING ZHOU, Plasma Science and Fusion Center, Massachusetts Institute of Technology, Cambridge, MA 02139 — A self-consistent phase-space moment description is developed for high-energy-density plasma jets. The phase-space moment theory is the truncated moment average of the kinetic equation. Using the phase-space moment theory, the root-mean-square (rms) envelope equations, which describe the orientation and size of the plasma jet, are derived for high-energy-density plasma jets. The envelope equations are demonstrated to agree with the virial theorem. To study the role of magnetic field helicity in plasma jet compression, a simplified model of a plasma jet is employed, and a complete set of equations governing the plasma jet is derived. The characteristic distance over which the compression occurs is calculated.

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