Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Envelope equation of a plasma jet[1] CHIPING CHEN, Massachusetts Institute of Technology — A self-consistent phase-space moment description is developed for high-energy-density plasma jets in the context of plasma jet approaches to high-energy density physics (HEDP). 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. In the regime where the internal field energy density is negligibly small compared with the thermal energy density and the internal flow energy density (Zhou and Chen, 2008), the rms envelope and density profiles for a plasma jet column are determined analytically, and used to predict the characteristics of a plasma jet column under compression.

[1]Research supported by DOE Grant No. DE-FG02-05ER54836.

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Date submitted: 20 Jul 2009 Electronic form version 1.4