

Abstract Submitted  
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**Adiabatic compression and expansion of a plasma jet**<sup>1</sup> CHIPING CHEN, MIT — The rms envelope equation of a plasma jet has been developed to determine the profiles of plasma jets undergoing adiabatic compression and expansion. Recently, experimental data have become available for comparison between theory and experiment. In a comparison with the fast pressure probe measurements [S. Messer, A. Case, R. Bomgardner, M. Phillips, and F.D. Witherspoon, *Phys. Plasmas* **16**, 064502 (2009)] in the Plasma Jet Driven Magnetoinertial Fusion (PJMIF) experiment at HyperV Technologies Corporation [F.D. Witherspoon, A. Case, S.J. Messer, R. Bomgardner II, M. W. Phillips, S. Brockington, R. Elton, *Rev. Sci. Instrum.* **80**, 083506 (2009)], good agreement is found between the rms envelope theory and the PJMIF experiment performed at HyperV Technologies Corporation. Although the plasma jet underwent adiabatic expansion in the PJMIF experiment at HyperV Technologies Corporation, an important implication of the rms envelope theory is that a plasma jet can be compressed adiabatically, resulting in an increase in the energy density of the plasma jet.

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