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Suppression of Weibel Instabilities in Advanced Fast Ignition Laser Fusion Pellets by Two Cone-Guided Relativistic Laser Beams¹

V. STEFAN, Nikola Tesla Laboratories, Stefan University, 1010 Pearl, La Jolla, CA 92038-2946 — I propose utilization of two cone-guided relativistic laser beams in antiparallel interaction with the fusion pellet as a novel approach for the suppression of Weibel instabilities in the core of advanced fast ignition pellets.² The propagation of generated suprathreshold electron beam toward the core may lead to the appearance of colossal (~ 10 MG), small scale ($L \sim$ velocity of light/local electron plasma frequency³) magnetic fields. This would suppress the transport of magnetic fields into the core of the pellet and may eliminate the difficulties in the nonlinear-relativistic treatment of magnetized core plasma.

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²M. Tabak, J. Hammer, M.E. Glinsky, W.L. Kruer, S. C. Wilks, J. Woodworth, E. M. Campbell, and M.D. Perry, Phys. Plasmas 1 (5), 1626 (1994).

³V. Stefan, Suppression of Weibel Instabilities by High-Harmonic Electron Bernstein Modes in Advanced Fast Ignition Laser Fusion Pellets.APS-2006. October 30-November 3, 2006; Philadelphia, Pennsylvania.

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