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Proton Beam Fast Ignition Fusion: Synergy of Weibel and Rayleigh-Taylor Instabilities[1] V. ALEXANDER STEFAN, Institute for Advanced Physics Studies (Stefan University), 1010 Pearl Street, La Jolla, CA 92038-2946 — The proton beam generation and focusing in fast ignition[2] inertial confinement fusion[3] is studied. The spatial and energy spread of the proton beam generated in a laser-solid interaction is increased due to the synergy of Weibel and Rayleigh-Taylor instabilities.[4] The focal spot radius can reach 100μm, which is nearly an order of magnitude larger than the optimal value. The energy spread decreases the beam deposition energy in the focal spot. Under these conditions, ignition of a precompressed DT fuel is achieved with the beam powers much higher than the values presently in consideration.

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[2]M. Roth et al , Phys. Rev. Lett. 86, 436 (2001); M. Tabak et al, Phys. Plasmas 1 (5), 1626 (1994).
[3]K. .A. Brueckner and V. Stefan, *Possibility of Anomalous Plasma Effects in Heavy-Ion Beam Fusion*, Bul. Am. Phys. Soc., 27, 8 (1982).
[4]V. Alexander Stefan, *Nonlinear Electromagnetic Radiation Plasma Interactions*, (S-U-Press, 2008)

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