

Abstract Submitted
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Experimental Study of Current Filamentation Instability¹ BRIAN ALLEN, University of Southern California, JOANA MARTINS, LUÍS O. SILVA, Instituto Superior Técnico, VITALY YAKIMENKO, KARL KUSCHE, MARCUS BABZIEN, MIKHAIL FEDURIN, Brookhaven National Laboratory, CHENGKUN HUANG, Los Alamos National Laboratory, PATRIC MUGGLI, University of Southern California — Current Filamentation Instability, CFI, is of central importance for the propagation of relativistic electron beams in plasmas and could play an important role in the generation of magnetic fields and of radiation in the after-glow of gamma ray bursts and for energy transport in the fast-igniter inertial confinement fusion concept. Simulations of the ATF beam and plasma parameters using the particle-in-cell code QuickPIC indicate the presence of the CFI. Our goal is to experimentally study and characterize the CFI at the ATF at BNL as a function of beam and plasma parameters. The experiment has two stages; the first stage incorporates longitudinal diagnostics (longitudinal density) and the second is transverse diagnostics (magnetic field and transverse density). We have started the first phase and present simulation results, experimental setup and considerations, results to date and transverse diagnostic design.

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