

## **Simulation of Current Filamentation Instability for an Accelerator Beam in a Capillary Plasma**

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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. Using the particle-in-cell code QuickPIC, we simulate the propagation of the electron beam at the Brookhaven National Laboratory - Accelerator Test Facility, BNL-ATF, in a cm-long plasma produced by a capillary discharge. The occurrence of the instability is investigated as a function of electron beam parameters (including charge and emittance) and plasma parameters (density and length) by evaluating the beam density and magnetic energy. Results show that with beam and plasma parameters achievable at the BNL-ATF the CFI should be observed within 2 cm of plasma. We present simulation results and outline the experiment we will perform at the BNL-ATF.