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## **FACET-II E-305: Beam filamentation and bright gamma-ray bursts**

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Relativistic streaming plasma instabilities and their growth rates are subject of research for the description of jet-like astrophysical plasmas due to their strong influence on energy transfer between plasma-constituent, electromagnetic fields and photons. Therefore, these instabilities are of relevance in the description of highly energetic astrophysical phenomena such as e.g. the formation of gamma-ray bursts.

Moreover, recent studies indicate that the magnetic fields arising from the transverse filamentation instability in relativistic electron beams can be harnessed to generate intense gamma-ray flashes from synchrotron-like radiation.

The E-305 collaboration aims to study relativistic beam-plasma instabilities with the 10 GeV electron beam of unprecedented intensity provided by FACET-II at SLAC National Accelerator Laboratory. By propagating the beam through solid-density targets and high-density gas jets the dynamic of instabilities will be probed and the efficacy of gamma-ray generation will be evaluated.

We report on the status of commissioning efforts and first experimental results attained in recent beamtime. Next steps, goals and prospects will be discussed.

### **Acknowledgments**

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