



MEETING OF THE AMERICAN PHYSICAL SOCIETY DIVISION OF PARTICLES AND FIELDS

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Plans for Ultra-intense beams at FACET-II and experiments to probe High

FACET-II (Facility for Advanced Accelerator Experimental Tests) will be a unique R&D facility for experimental beam physics using one kilometer of the SLAC linac. It is a follow-on facility to continue the research programs carried out at FFTB and FACET. While operating as a National User Facility, FACET simultaneously executed a multi-year program to help assess Plasma Wakefield Acceleration (PWFA) as a technology for future accelerators. FACET-II will provide a major upgrade over FACET capabilities and support a much broader research program. The FACET-II beam can also enable research where extremely strong fields are generated by tightly compressed electron beams. An individual bunch of electrons at FACET-II will have 35 joules of stored energy with possibility to be compressed to ~2fs duration and focused to ~100nm transversely – while operating at 30Hz. For a several research directions, this is similar to a 10PW laser beam reaching a peak intensity of 4.1025 W/cm². The differences between the interactions of FACET-II's intense electron bunches and 10PW laser beam open exciting opportunities for complementary research.

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