

Abstract Submitted
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BELLA Petawatt Laser for Ultrahigh-Intensity High Energy Density Physics within LaserNetUS¹ KEI NAKAMURA, SVEN STEINKE, LIESELOTTE OBST-HUEBL, JIANHUI BIN, QING JI, ANTHONY J. GONSAIVES, STEPAN S. BULANOV, CAMERON G. R. GEDDES, CARL B. SCHROEDER, ERIC ESAREY, THOMAS SCHENKEL, Lawrence Berkeley National Laboratory — In this presentation, we will report on the status of HEDP at the BELLA petawatt facility with a large laser spot beamline ($f\backslash65$, ~ 1019 W/cm²). Based on accelerated ion beams with a strongly reduced divergence and increased charge, we built an all-plasma-based beamline for controlled material processing and radiobiological studies. We will give an outlook on science enabled by a short-focal length ($f\backslash2.5$) laser beamline that is currently under construction. The new short-focal length beamline will be equipped with a re-collimating double-plasma mirror to study laser-plasma interactions at the highest temporal contrast and intensities $>10^{21}$ W/cm² with a repetition rate up to 1 Hz, enabling, e.g., ion acceleration experiments with energies at the 100 MeV level. The BELLA center is part of LaserNetUS providing access to domestic and international users.

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