Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Update on BELLA Center laser system development towards a compact Thomson photon source[1] TOBIAS OSTERMAYR, HAI-EN TSAI, Lawrence Berkeley National Laboratory, WILLIAM WALLACE, UC Berkeley, KAILTLIN DEERING, ROBERT ETTELBRICK, JEROEN VAN TILBORG, FUMIKA ISONO, SAMUEL BARBER, REMI LEHE, JEAN-LUC VAY, ANTHONY GONSALVES, KEI NAKAMURA, CSABA TOTH, CARL SCHROEDER, CAMERON GEDDES, ERIC ESAREY, Lawrence Berkeley National Laboratory
— Thomson scattering of laser pulses from relativistic electron beams can produce bright, narrow energy-spread MeV photon beams, with relevance to many applications including nuclear nonproliferation. Here we present a 5 Hz, 40 fs, 100 TW class laser system at the BELLA Center, dedicated to this light source development. The system consists of two independently tunable and compressible Ti:Sapphire multipass-amplifier arrays (2.8 J and 0.7 J on target, respectively) with the seed-beam split off just after the common CPA stretcher. Additionally, an independently tunable 40-fs probe beam is available in various configurations. We discuss the system layout, commissioning, performance, stability and alignment procedures to enable stable day-to-day operation and multi-beam experiments. Stable electron beams have been established via ionization injection with further source development and Thomson scattering experiments underway.

[1]Work supported by US DOE NNSA DNN RD and by Sc. HEP

Tobias Ostermayr
Lawrence Berkeley National Laboratory

Date submitted: 03 Jul 2019 Electronic form version 1.4