Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Modeling multi-GeV class laser-plasma accelerators with INF&RNO[1] CARLO BENEDETTI, CARL SCHROEDER, STEPAN BULANOV, CAMERON GEDDES, ERIC ESAREY, WIM LEEMANS, Lawrence Berkeley Natl Lab — Laser plasma accelerators (LPAs) can produce accelerating gradients on the order of tens to hundreds of GV/m, making them attractive as compact particle accelerators for radiation production or as drivers for future high-energy colliders. Understanding and optimizing the performance of LPAs requires detailed numerical modeling of the nonlinear laser-plasma interaction. We present simulation results, obtained with the computationally efficient, PIC/fluid code INF&RNO (INtegrated Fluid & paRticle simulatioN cOde), concerning present (multi-GeV stages) and future (10 GeV stages) LPA experiments performed with the BELLA PW laser system at LBNL. In particular, we will illustrate the issues related to the guiding of a high-intensity, short-pulse, laser when a realistic description for both the laser driver and the background plasma is adopted.

[1]Work Supported by the U.S. Department of Energy under contract No. DE-AC02-05CH11231.

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Date submitted: 15 Jul 2016 Electronic form version 1.4