Abstract Submitted
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Simulations of multiple consecutive laser-plasma acceleration stages[1] JEAN-LUC VAY, CAMERON GEDDES, ERIC ESAREY, CARL SCHROEDER, WIM LEEMANS, SATOMI SHIRAISHI, THOMAS SOKOLLIK, Lawrence Berkeley National Lab — Staging of multiple laser-plasma accelerators in series is important to increase peak energy while maintaining large average gradient. Such staging can circumvent the usual tradeoff wherein higher energies require lower plasma density and hence lower gradient. Simulations are being conducted that show acceleration to the maximum energy in a first stage, then coupling to and further acceleration in subsequent stages. Simulations have been performed with the Particle-In-Cell code Warp, using the boosted frame technique for higher efficiency. In front of each stage, the incoming laser is injected using the moving plane technique that was introduced in Warp. Between stages, the exiting laser is deflected by a plasma mirror that is modeled as a perfect conductor. Effects of beam coupling and control of the beam energy in the second stage and beyond are being characterized and will be discussed.

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