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Simulating Extremely Large-Scale Laser-Plasma Interactions of NIF Experiments[1] STEVEN H. LANGER, RICHARD L. BERGER, LAURENT M. DIVOL, MILO R. DORR, DENISE E. HINKEL, JEFFREY A. F. HITTINGER, A. BRUCE LANGDON, CHARLES H. STILL, EDWARD A. WILLIAMS, Lawrence Livermore National Laboratory — National Ignition Facility (NIF) laser beams will propagate through several mm of plasma between where they enter the hohlraum and where they deposit their energy near the hohlraum wall. Patch simulations, which propagate a small cross-section of the laser beam through the plasma to the wall, demonstrate beam propagation with acceptable levels of laser scatter and spray for 2010 ignition targets. However, these simulations must be normalized to whole beam simulations (C.H. Still et al., this meeting). Such simulations are extremely large calculations, requiring thousands of CPUs on the world's most advanced parallel computers, such as ASC Purple and Blue Gene/L. Simulations of this scale introduce a number of difficulties, including diagnosis. We will show results from these simulations, demonstrating the ability to run effectively on thousands of processors. We will briefly discuss the technologies that enable these calculations and the diagnostics we use to understand them.

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