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Modeling laser-plasma interactions of an entire NIF beam using all of Blue Gene Light C.H. STILL, D.E. HINKEL, A.B. LANGDON, S.H. LANGER, E.A. WILLIAMS, LLNL — In 2010, there will be an experimental campaign to achieve ignition on the National Ignition Facility (NIF) using ∼1.2 MJ of laser energy. In preparation for such a campaign, ignition targets are being carefully analyzed with regard to laser-plasma interactions. We use pF3d[1] to perform these calculations[2] of ignition point designs[3] on near whole-beam volumes, dubbed "letterboxes", in which the entire extent of the beam is used in the radial direction, and enough of the beam in the azimuthal direction to achieve sufficient speckle statistics. These letterbox calculations require tens of thousands of CPU days on large massively parallel computers, and until recently, simulating an entire beam volume has been out of reach. In this presentation, we report on results obtained from the first ever simulation of an entire NIF outer beam volume propagating in a CH-ablator ignition point design at 300 eV using 196,608 CPUs of Blue Gene/L, one the world's fastest supercomputers.[4]We also describe progress in benchmarking our letterbox simulations with this entire beam run. This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. 1. R. L. Berger *et al., Phys. Plasmas* **5**, 4337, (1998); C. H. Still, et. al, *Phys. Plasmas* **7**, 2023 (2000). 2. D. E. Hinkel *et al.*, "Analyses of laser-plasma interactions in National Ignition Facility ignition targets", *Phys. Plasmas* **15**, 056314 (2008). 3. D. A. Callahan *et al.*, *Bull. Am. Phys. Soc.***52**, 316 (2007). 4. http://www.tops500.org

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