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Integrated Fast ignition Experiments on the NIF[1] C.D. CHEN, PRAVESH PATEL, PETER AMENDT, DAN CLARK, BRUCE COHEN, DAN HEY, LAURENT DIVOL, DOUG HOMOELLE, NOBUHIKO IZUMI, ANDREAS KEMP, MIKE KEY, DAVID LARSON, BARBARA LASKINSKI, SEBASTIEN LE PAPE, ANDREW MACKINNON, ANDREW MACPHEE, HARRY MCLEAN, DON MEEKER, YUAN PING, HANK SHAY, DAVID STROZZI, MAX TABAK, RICHARD TOWN, SCOTT WILKS, Lawrence Livermore National Laboratory — The National Ignition Facility at LLNL will provide the first capability for assembling the fuel mass and ρR required for full-scale Fast Ignition. A quad of NIF beams converted to short-pulse operation will provide an ignitor pulse with which to determine the efficiency of fast electron energy coupling to the ignition hot spot. In this talk we review progress in the design of fast ignition core heating experiments that use: (i) 600 kJ of NIF laser energy in indirect-drive to compress DT (cryo) and CD (warm) capsules, and (ii) 8 kJ of ARC at 5 ps duration injected via a Au cone to heat the assembled fuel. We describe 2-D integrated hohlraum and capsule designs that optimize the peak density, ρR and spatial uniformity of the fuel assembly around the cone tip. The interaction of the short-pulse ignitor beam in the cone is simulated with the 3-D PSC explicit particle-in-cell (PIC) code, and the subsequent transport of the electrons and core heating calculated with the LSP hybrid transport code.

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Pravesh Patel
Lawrence Livermore National Laboratory

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