

LA-UR- 11-01739

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Title: SUMMARY OF THE FIRST NEUTRON IMAGE DATA
COLLECTED AT THE NATIONAL IGNITION FACILITY

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Intended for: Inertial Fusion Sciences and Applications, September 12-16
2011, Bordeaux-Lac, France



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SUMMARY OF THE FIRST NEUTRON IMAGE DATA COLLECTED AT THE NATIONAL IGNITION FACILITY

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A summary of data and results from the first neutron images produced by the National Ignition Facility (NIF), Lawrence Livermore National Laboratory, Livermore, CA, USA will be presented. The NIF neutron imaging diagnostic was designed and constructed to collect images of source and scattered neutrons produced in inertial confinement fusion experiments. Source neutrons are produced by fusion reactions in the hot core of the implosion, while scattered neutrons result dominantly from (n,n') reactions by source neutrons in the surrounding dense material. An overview of the neutron imaging technique will be presented, including hardware and analysis methods, as well as a summary of the data collected and measurements made to date. Data will include images from direct drive, DT exploding pusher target experiments, as well as, indirect drive THD target ignition experiments. Analyzed result presented will include shape distributions from source and scattered neutrons, down-scattered ratio analyses, areal density analyses, and comparison with X-ray image data. This work was performed for the U.S. Department of Energy, National Nuclear Security Administration and by the National Ignition Campaign partners; Lawrence Livermore National Laboratory (LLNL), University of Rochester -Laboratory for Laser Energetics (LLE), General Atomics (GA), Los Alamos National Laboratory (LANL), Sandia National Laboratory (SNL). Other contributors include Lawrence Berkeley National Laboratory (LBNL), Massachusetts Institute of Technology (MIT), Atomic Weapons Establishment (AWE), England, and Commissariat à l'Énergie Atomique (CEA), France. Prepared by LLNL under Contract DE-AC52-07NA27344