

A SUMMARY OF THE NEW (ADDITIONAL) NUCLEAR DIAGNOSTICS FOR THE NATIONAL IGNITION FACILITY

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The National Ignition Facility (NIF) is a 192-laser beam facility designed to support the Stockpile Stewardship, High Energy and Inertial Confinement Fusion programs. This paper will update the status of additional nuclear diagnostics added to NIF to improve the understanding of the imploding capsules. The long-term goal of nuclear diagnostics is to obtain at minimum three orthogonal Lines of Sight (LOS) for multiple nuclear diagnostics. This will contribute to obtaining three-dimensional shape information. In the last year NIF has added an opposed Nuclear Time of Flight (NToF) on the north pole, a second neutron imaging LOS on the north pole, and a Gas Cherenkov Detector, GCD, in a well 3.9 meter from TCC. In addition, 48 Real Time Nuclear Activation Devices (RTNADS) are being added onto the target chamber in a spherical distribution to measure the angular distribution of the fusion neutron yield. In addition, a third neutron imaging LOS is in the conceptual design phase, as well as new Quartz Cherenkov detectors for more precise NToF measurements are being implemented. These diagnostics are fully integrated into the NIF through complex control software, critical alignment systems and automated software data analysis.

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