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New Fast Neutron Time-of-Flight Detectors with Subnanosecond Instrument Response Function for DT Implosions on OMEGA VLADIMIR GLEBOV, CHAD FOREST, JAMES KNAUER, OWEN MANNION, SEAN REGAN, MARK ROMANOFSKY, THOMAS SANGSTER, CHRISTIAN STOECKL, Laboratory for Laser Energetics, University of Rochester — Two new fast neutron time-of-flight (nTOF) detectors were recently deployed on the OMEGA laser. The detectors use 10-mm-diam Hamamatsu microchannel platephotomultiplier tubes (MCP-PMT's) without any scintillator. The elimination of the scintillator removes the scintillator decay from the instrument response function (IRF) and makes the IRF of the PMT nTOF faster than a traditional nTOF detector. The two PMT nTOF detectors are located along antipodal lines of sight at 4.9 m and 10.4 m from the target chamber center. The PMT nTOF detectors are designed to measure neutron yield, ion temperature, and bulk fuel velocity in DT cryogenic implosions on OMEGA. The results of the measurements in experiments with cryogenic and room-temperature implosions over a wide range of neutron yields and ion temperatures will be presented. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856.

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