

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

D-D proton spectra and emission imaging for diagnosing imploded capsules on Shengguang III laser prototype facility JIAN TENG, TIANKUI ZHANG, YUDONG PU, BO WU, WEI HONG, BIN ZHU, WEIHUA HE, FENG LU, LIANQIANG SHAN, XIANLUN WEN, WEIMIN ZHOU, LEIFENG CAO, SHAOEN JIANG, YUQIU GU, Laser Fusion Research Center, China Academy of Engineering Physics — Understanding and controlling implosion dynamics are critical for progress in inertial confinement fusion (ICF). Primary D-D protons spectra and emission imaging is used for diagnosing areal density and implosion asymmetries on Shengguang III laser prototype facility with low neutron yields for the first time. An accurately calibrated charged particle spectrometer (CPS) is used with CR39 detector for the measurement of the proton spectra. The properties of the noise and proton signal on the CR39 are characterized, and the spectra of the implosion proton are obtained by excluding the noise. For the investigation of the implosion asymmetries, a new method of directly imaging of primary DD protons in the implosion region by miniature magnetic quadrupole lenses is proposed. The imaging properties such as spatial resolution and focus length are investigated by simulation and calibration experiment.

Jian Teng
Laser Fusion Research Center, China Academy of Engineering Physics

Date submitted: 11 Jul 2013

Electronic form version 1.4