Abstract Submitted
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Implosion anisotropy of neutron kinetic energy distributions as measured with the neutron time-of-flight diagnostics at the National Ignition Facility[1] EDWARD HARTOUNI, MARK ECKART, JOHN FIELD, GARY GRIM, ROBERT HATARIK, ALASTAIR MOORE, DAVID MUNRO, DANIEL SAYER, DAVID SCHLOSSBERG, Lawrence Livermore Natl Lab — Neutron kinetic energy distributions from fusion reactions are characterized predominantly by the excess energy, Q, of the fusion reaction and the variance of kinetic energy which is related to the thermal temperature of the plasma as shown by *e.g.* Brysk[2]. High statistics, high quality neutron time-of-flight spectra obtained at the National Ignition Facility provide a means of measuring small changes to the neutron kinetic energy due to the spatial and temporal distribution of plasma temperature, density and velocity. The modifications to the neutron kinetic energy distribution as described by Munro[3] include plasma velocity terms with spatial orientation, suggesting that the neutron kinetic energy distributions could be anisotropic when viewed by multiple lines-of-sight. These anisotropies provide a diagnostic of burn averaged plasma velocity distributions. We present the results of measurements made for a variety of DT implosions and discuss their possible physical interpretations.

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[2]H. Brysk, *Plasma Phys.,* **15** 611 (1973)
[3]D. H. Munro, *Nucl. Fusion,* **56** (2016) 036001

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