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FROM NIF IMPLOSIONS

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## COMPARISON OF NEUTRON AND X-RAY EMISSION FROM NIF IMPLOSIONS (U)

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Directly laser driven and X-radiation driven DT filled capsules differ in the relationship between neutron and X-ray images. Shot N110217, a directly driven DT-filled glass micro-balloon provided the first neutron images at the National Ignition Facility. As seen in implosions on the Omega laser, the neutron image can be enclosed inside the contour of the time integrated X-ray images, and the time resolved ones at a time near peak neutron emission rate. HYDRA simulations show the X-ray image is dominated by emission from the glass shell while the neutron image arises from the DT fuel it encloses. In the absence of mix or jetting, X-ray images of a plastic shell, cryogenically layered THD fuel capsule should be dominated by emission from the hydrogen itself rather than the cooler plastic shell which is separated from the hot core by cold DT fuel. This cool, dense DT, invisible in X-ray emission, shows itself by scattering hot core neutrons. Time gated images of neutrons between 10 and 12 MeV show this fuel shell, which is not present in directly driven glass micro-balloons.

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