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Investigation of weakly deuterium doped tritium capsules as a technique to measure hot spot ignition properties. MELISSA DOUGLAS, PAUL BRADLEY, Los Alamos National Laboratory — An important step in gaining confidence in the capability of hot spot ignition in cryogenic D/T capsules is the experimental characterization of the hot spot region. Currently this is difficult to accomplish because of the intense high energy of neutrons that can create substantial background noise, or worse, damage diagnostics, making X-ray imaging of the hot spot region as it forms difficult. One approach in minimizing the deleterious effects of neutrons in hot spot imaging calls for a reduction of deuterium in the baseline D/T (50/50 mixture) capsule. By limiting the number of D/T reactions, the neutron flux will be lowered as well as the neutron energies. The desired effect is thus to decrease the neutron flux to an “acceptable” diagnostic level while maintaining hot spot conditions, i.e. effective ρr and heating, that would be found in the baseline capsule design. Here we computationally investigate the effects of modifying the D/T ratio and explore the feasibility of this proposed technique.

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