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**Estimates of the DT Fusion Gamma Spectrum Using an Energy Thresholding Gas Cherenkov Detector** COLIN HORSFIELD, MICHAEL RUBERY, AWE, HERRMANN HANS, JOSEPH MACK, CARL YOUNG, STEVEN CALDWELL, EVANS SCOTT, THOMAS SEDILLO, YONGHO KIM, GERRY HALE, RAHUL SHAH, LANL, MILLER KIRK, NSTec, STOEFLL WOLFGANG, LLNL — In addition to alphas and neutrons, the DT fusion reaction also produces gamma rays from the intermediate excited 5He nucleus with a small branching ratio 10E-5 gamma/n. The very small branching ratio of the gamma-rays are mitigated by the very large yields that are expected on NIF (10E+19 ). The excited 5He can produce gamma-rays by decay to the ground state, emitting a 16.75 MeV gamma-ray (width 0.5 MeV), or to a broad first excited state emitting a 12 MeV gamma ray (width 5 MeV). Knowledge of the relative gamma-ray BR of these two states, from which we infer the DT gamma ray spectrum, is important to making absolutely calibrated measurements on a variety of experiments. We have carried out an energy thresh-holding experiment for DT ICF implosions on the Omega laser using a Gas Cherenkov Detector, and compared the relative intensities at various thresholds with theoretical gamma spectra folded with detector response as calculated by ACCEPT and GEANT4 codes. We present recent results from this experiment, our estimate of the precision of the DT fusion gamma spectrum and the implications for the future determination of the DT gamma/n BR.

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