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**Simulation of a gamma reaction history (GRH) detector for use at the National Ignition Facility (NIF)** ELLIOT GRAFIL, JONATHAN TOEBBE, Colorado School of Mines — Reaction history measurements are critical to diagnosing inertial confinement fusion (ICF) implosions. As such they will be essential components of the National Ignition Facility (NIF) diagnostics. One proposed method to record the reaction history is the construction of a gamma-sensitive gas Cerenkov detector. An array of these Cerenkov detectors can be used to discriminate between the different gamma ray energies produced during the ICF implosion. These fusion gammas are converted to optical photons for collection by fast recording systems. We have simulated the gamma reaction history (GRH) detector under development at NIF and LANL using Geant4. Our simulations have been used to determine energy cut-off ranges for photon production in various gases, optimizing converter material and thickness, and discriminating between proposed detector geometries in order to minimize the temporal spread of the signal.

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