Gamma Reaction History Backgrounds at the NIF[1] J.A. CHURCH,
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HERRMANN, Y.H. KIM, LANL, E. GRAFIL, CSM — The Gamma Reaction History (GRH) diagnostic at NIF detects gamma-rays, emitted directly from DT fusion
reactions (DTγ), through the use of four Gas Cherenkov detectors with adjustable
gamma-ray energy thresholds. It is primarily used to determine bang time, burn
width and total DT yield of the implosion. Background interference to the signal is
insignificant when capsules are driven directly by the lasers, but can be significant
during indirect-drive using a hohlraum, forming an approximately 20 ns plateau
under the narrow $\sim$200 ps FWHM fusion signal. This background is independent
of fusion yield and most likely the result of laser-plasma interaction (LPI) induced
hot electron bremsstrahlung radiation. These hard x-rays stream out target chamber ports and take multiple scatter paths to reach the GRH photomultiplier tubes
(PMT), where they then bypass the Cherenkov conversion process and generate signal by direct interaction with the PMT microchannel plates. An examination of this
background contribution to the GRH signal and possible mitigation strategies will
be presented.

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