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Calibration of the NIF Electron Positron Proton Spectrometers (NEPPS) for Intense Laser Solid Interactions[1] JENS VON DER LINDEN, LLNL, JOSE RAMOS-MENDEZ, BRUCE FADDEGON, UCSF, GENNADY FIKSEL, LOUISE WILLINGALE, University of Michigan, JONATHAN PEEBLES, University of Rochester, JOE P HOLDER, MATTHEW R EDWARDS, HUI CHEN, LLNL — Electron-positron pairs, produced in intense laser-solid interactions, are diagnosed using magnetic spectrometers with imaging plates. NEPPS are such spectrometers which capture the electron, positron, and proton energy spectra. We have calibrated the NEPPS with six electron beams ranging in energy from 3-15 MeV from a Siemens Oncor accelerator. The Geant4 TOPAS Monte-Carlo simulation was set up with an accurately characterized beam source to match depth dose curves and lateral profiles measured in water. Analysis of the scanned imaging plates together with the determined electron fluence and energy distribution arriving in the spectrometer provide improved dispersion curves for the NEPPS and electron dosage responses of the photo-stimulated luminescence effect. Notably, the background signal on the imaging plates during this calibration resembles the background profiles measured in laser-solid experiments. We use the Monte-Carlo simulation to characterize sources of this background by tracking photons originating from the interaction of the calibration beams and the NEPPS structure.

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