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Measuring X-ray Spectra of Flash Radiographic Sources
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oratory, TIM WEBB, Sandia National Laboratory — A Compton spectrometer has
been re-commissioned for measurements of flash radiographic sources. The deter-
mination of the energy spectrum provides information about the x-ray production
mechanisms of these sources (ie. reaction history of plasmas, electron-target inter-
actions) and benefits the analysis of images obtained at radiographic facilities. How-
ever, the measurements of the spectra are difficult due to the high count rates and
short nature of the pulses (~ 50 ns). The spectrometer is a 300 kg neodymium-iron
magnet which measures spectra in the <1 MeV to 20 MeV energy range. Incoming
x-rays are collimated into a narrow beam incident on a converter foil. The ejected
Compton electrons are collimated so that the forward-directed electrons enter the
magnetic field region of the spectrometer. The position of the electrons at the focal
plane of the magnet is a function of their momentum, allowing the x-ray spectrum to
be reconstructed. Recent measurements of both flash and continuous radiographic
sources will be presented.

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