

Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Calibration of AGFA D4 and D3sc X-Ray Films in the 0.7 to 4.6 keV Energy Range for NIF Opacity Spectrometer.¹ ERIC DUTRA, ALICE DURAND, RUSSELL KNIGHT, RAUL LARA, GABRIEL TORRES, MATTHEW WALLACE, Nevada National Security Site, JIM EMIG, ROBERT HEETER, Lawrence Livermore National Laboratory, JOE COWAN, TED PERRY, Los Alamos National Laboratory, JAMES KNAUER, ⁴Laboratory for Laser Energetics — X-ray films still remain a key asset for high-resolution X-ray spectral imaging in High-Energy Density (HED) experiments conducted at the National Ignition Facility (NIF). The soft X-ray Opacity Spectrometer (OpSpec) fielded at the NIF has an elliptically shaped crystal design that measures X-rays in the 900-2100 eV range and currently uses image plates as the detecting medium. However, the higher spatial resolution of AGFA D4 and D3sc X-ray films provides increased spectral resolution to the data over the current IP-TR image plates, which drives the new iteration of OpSpec to include X-ray film as a detecting medium. The calibration of AGFA D4 and D3sc X-ray films used in new iterations of the OpSpec is communicated here. These calibration efforts are vital to the NIF opacity measurements and are conducted in a previously un-studied X-ray energy range under a new film development protocol required by NIF. The absolute response of AGFA D4 and D3sc X-ray films from 705 to 4620 eV is being measured using the Nevada National Security Site Manson X-ray source with select anodes and filters to produce well-defined X-ray line energies.

¹This work was done by Mission Support and Test Services, LLC, under Contract No. DE-NA0003624 with the U.S. DOE. DOE/NV/036240806.

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Date submitted: 08 Jul 2020

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