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Characterizing laser-based MeV radiographic capability at NIF-ARC.[1] DEAN RUSBY, FELICIE ALBERT, DAVID ALESSI, HUI CHEN, KELLY HAHN, EUGENE HENRY, Lawrence Livermore National Laboratory, MATT HILL, AWE, ANDREAS KEMP, SHAUN KERR, Lawrence Livermore National Laboratory, PAUL KING, Univeristy of Texas, NUNO LEMOS, ANDREW MACKINNON, ANDREW MACPHEE, ARTHUR PAK, DAVID SCHLOSSBERY, SCOTT WILKS, JACKSON WILLIAMS, Lawrence Livermore National Laboratory — X-ray radiography of high-areal density objects is desirable for many applications. During high-energy laser-solid interactions (>1 x 10^{18} W/cm^2), a population of hot-electrons are accelerated to mega-electron volt energies. Injecting this population into a high-Z, high-density converter creates a similarly high-energy x-ray beam via bremsstrahlung. These x-rays have been shown to have a small source size (100s μm), high dose (several Rad) and high temperature (>1 MeV)[1]. We've performed experiments on NIF-ARC to benchmark the photon spectra. Diagnosing the x-ray spectrum in this regime is difficult due to low interaction cross sections. We have used a suite of complimentary diagnostics, such as photo-nuclear activation and absorption spectrometers, to reconstruct the spectrum. These experiments at NIF ARC have shown that the temperature of these x-rays is on the order of several MeV.

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