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Enhanced MeV Energy X-Ray Yield using Advanced Targets.[1]
NUNO LEMOS, ARTHUR PAK, JACKSON WILLIAMS, DEAN RUSBY, SHAUN KERR, HUI CHEN, Lawrence Livermore Natl Lab, JESSICA SHAW, Laboratory for laser energetics, PAUL KING, ADEOLA CROWN AGHEDO, FELICIE ALBERT, SCOTT WILKS, ANDREAS KEMP, CRAIG SIDERS, ANDREW MACPHEE, ANDREW MACKINNON, Lawrence Livermore Natl Lab — High-energy x-rays have the ability to passively probe/radiograph HED matter providing essential information to inertial confinement fusion, astrophysical systems, planetary interiors and fundamental plasma physics. Laser produced x-rays are key tools in this exploration due to their ability to produce broad band x-ray sources with large flux (~10^{13}-10^{14} photons/steradian/MeV) of >2 MeV photons that are necessary to radiograph high-areal density objects. In this work we generate a high yield x-ray source through bremsstrahlung by irradiating a high-Z target with a kJ, ps laser. We increased the laser to target coupling by using advanced targets, such as compound parabolic concentrators and capillary structured targets.

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