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Imaging of small-scale dynamic phenomena with a laser-wakefield acceleration driven x-ray source[1] MARIO BALCAZAR, Center for Ultrafast Optical Science, University of Michigan, MATTHEW STREETER, ROB SHALLOO, JAN-NICLAS GRUSSE, ZULFIKAR NAJMUDIN, STUART MANGLES, The John Adams Institute for Accelerator Science, Imperial College London, STEPHEN DANN, DAN SYMES, CHRIS THORNTON, Central Laser Facility, STFC Rutherford Appleton Laboratory, CHRIS MURPHY, CHRISTOPHER UNDERWOOD, CHRIS BAIRD, CHRIS ARRAN, MATTHEW SELWOOD, York Plasma Institute, Department of Physics, University of York, ANDRE ANTOINE, JASON CARDARELLI, ASHWIN SHAHANI, ALEC THOMAS, NING LU, Center for Ultrafast Optical Science, University of Michigan, STEVEN JAMISON, The Cockcroft Institute — Laser wakefield accelerators are a promising alternative for generation high-brightness and coherent x-rays at a fraction of the cost and facility size of conventional synchroton-like electron accelerators. The radiation source is mediated by the oscillatory motion of electrons inside the plasma wakefield, also known as betatron oscillations. Characteristics of the x-ray source include low beam divergence (few miliradians), ultrafast femtosecond pulse duration, and micrometer size resolution. These properties make a wakefield accelerator radiation source an excellent candidate forimaging of ultrafast events with high-temporal and high-spatial resolution. In this work we present imaging of small scale dynamic phenomena using a betatron x-ray source generated by the interaction of a high-intensity laser pulse with agas cell. Some of the preliminary results of interest include properties of the betatron spectrum and imaging resolution.

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