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Characterizing Nanomaterial Response for sub-100 ps X-ray Scintillation MICHAEL SHERBURNE, TOD LAURVICK, LARRY BURGGRAF, Air Force Institute of Technology, IAN BEAN, PATRICK CRANDALL, MINZHEN DU, COLIN ADAMS, Virginia Polytechnic Institute and State University, ERIC BURKE, NASA Langley Research Center, MAREK OSINSKI, ARJUN SENTHIL, DOMINIC BOSOMTWI, SHRUTI GHARDE, GEMA ALAS, University of New Mexico, SERGEI IVANOV, VICTOR KLIMOV, IGOR FEDIN, THOMAS WEBER, Los Alamos National Laboratory, AIR FORCE INSTITUTE OF TECHNOLOGY COLLABORATION, VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY COLLABORATION, NASA LANGLEY RESEARCH CENTER COLLABORATION, LOS ALAMOS NATIONAL LABORATORY COLLABORATION — Measuring sub 100 ps quantum dynamics of x-rays in the 1 – 100 keV range is a need shared by many experimental programs and is beyond the capability of current techniques. We are investigating the feasibility of using colloidal quantum dots (CQDs) as a fast x-ray scintillator by functionalizing then experimentally characterizing the x-ray excitation and decay response of 13 varieties of CQDs. All variants will be evaluated for their stability, temporal decay characteristics. Functionalization will be using two fabrication methods; loading the nanomaterials into a polymer and drawing them into a microstructured photonic crystal fiber. Radiation response will be characterized at typical laboratory conditions (e.g, 23^{o}C). Based on previous studies we expect that CdSe nanoplatelets and $CsPbCl_3$ perovskite nanoplatelets will exhibit temporal resolutions under 100 ps. Photoluminescence decay will also be determined for the additional 11 nanomaterials when excited by a pulsed x-ray source.

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