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Development of Multi-GeV Electron Radiography for Measurements of Fast, Dynamic Systems FRANK MERRILL, CHRISTOPHER DANLY, JOSEPH FABRITIUS, FESSEHA MARIAM, DANIEL POULSON, RASPBERRY SIMPSON, PETER WALSTROM, CARL WILDE, Los Alamos National Laboratory — Charged particle radiography has been developed in the past decade to provide high-resolution, muti-frame flash radiography of dynamic systems. This development has focused on proton radiography utilizing 11 MeV to 50 GeV protons for a wide range of measurements. Recently, these techniques are being applied to the use of high energy electrons for applications at a future LANL MaRIE facility. At MaRIE Multi-GeV electrons will be used to diagnose small, quickly evolving systems, requiring resolution and frame rates beyond the capability of the existing 800 MeV proton radiography. The electron accelerator proposed for MaRIE will be capable of meeting the fast frame rate and resolution requirements for MaRIE. Because of the light mass of the electrons, bremsstrahlung processes become dominant in the electron interactions within the material being studied. Simulations have been performed to study these interactions, but measurements are required to fully understand the capabilities of this new measurement technique. A radiography system to make these measurements is being designed for measurements at the SLAC accelerator facility. We will present the plans for these measurements along with an estimate from simulations of the performance characteristics of a future capability.

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