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## Review of MeV energy scale accelerators, their capabilities, and common applications

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High Energy Density Physics (HEDP) is mostly related to charged particle beams, lasers, and plasma systems. Most of the available charged particle beam systems are either of low energies (keV scale, for example, medical x-rays) or of very high energies (>GeV, for example, SLAC accelerators, CERN for fundamental research). We need MeV energy scale accelerators to study the Bragg peaks of materials and for many other reasons, such as x-ray imaging of materials, medical isotopic production, dynamic structure analysis, plasma behavior studies, plasticity tests for drinking and ocean water, and more. To generate high-energy primary e-beams, an RF accelerator or induction accelerator is first to be considered, which are well known to the accelerator and beam physics communities. But RF accelerators have the limitation of acceleration in the range of several hundred micro-ampere-level currents. The induction accelerator can transport kA-level current, but the pulse duration is compressed to a nanosecond scale. We will review the performance of known medium-energy accelerators in search of their applications, high current (mA), and long pulse (ms) capability.

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