

Looking Inside Explosions: Proton Radiography at Los Alamos Lab

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The proton radiography (pRad) facility at Los Alamos National Lab uses high energy protons to acquire multiple frame flash radiographic sequences at megahertz speeds: that is, it can make movies of the inside of explosions as they happen. The facility is primarily used to study the damage to and failure of metals subjected to the shock forces of high explosives as well as to study the detonation of the explosives themselves. Applications include improving our understanding of the underlying physical processes that drive the performance of the nuclear weapons in the United States stockpile and developing novel armor technologies in collaboration with the Army Research Lab. The principle and techniques of pRad will be described, and examples of some recent results will be shown.