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Synchronizing a 40-mm powder gun to an accelerator JOHN WRIGHT, TIM TUCKER, CHARLES OWENS, BRIAN HOLLANDER, BRIAN JENSEN, Los Alamos National Laboratory — Over the past decade, there have significant efforts to couple gun systems to beam lines such as at the Advanced Photon Source (APS) and the Los Alamos Neutron Science Center (LANSCE) to use advanced diagnostics to study the dynamic properties of materials. Synchronizing a gun system to these beam lines is challenging and requires improved characterization of their operation and a significant reduction in the uncertainty of the system time (propellant initiation to impact). In this work, data will be presented that describes the operation of a 40-mm bore powder gun (maximum velocity 2 km/s) including details of the projectile configuration and the propellant assembly that was designed specifically to reduce the jitter in the overall system time. Measurements of breech pressure, projectile velocity, and impact times were used to develop the gun performance curve (LA-UR-17-21403).

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