Abstract Submitted
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Total Kinetic Energy Of Non-Thermal Electron-Beams In Z-Pinch Experiments[1] BEN HAMMEL, ERIK MCKEE, MATT WALLACE, University of Nevada at Reno, RADU PRESURA, Voss Scientific, AARON COVINGTON, TIM DARLING, University of Nevada at Reno — An approach to infer the total energy of energetic electron-beams generated in pulsed-power driven pinch experiments is discussed. Using x-pinch wire arrays, we measured the dynamic response of a target anode material as a result of ablative shock loading following the rapid deposition of energy from the incident electron-beam. The time-profile of the drive is obtained through measurement of bremsstrahlung emission with scintillator-PMT diagnostics. MCNP is then used to correlate electron-beam spectrum to the detected hard x-ray signal, and compared with experiments fielding a timer-resolved electron-energy analyzer. Shock strength is inferred by using a line-imaging Velocity Interferometer System for Any Reflector, which recorded the target's free-surface velocity at shock breakout. Lastly, hydrodynamic simulations in HYDRA allow us to infer the total energy of the drive under the boundary conditions of the measured drive profile and shock strength. Information on the total beam-energy provides a better understanding of plasma pinch dynamics that contribute to the observation of non-thermal bremsstrahlung and detection of cold-characteristic x-ray emission from "hot-spots."

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