Abstract Submitted
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Computational Exploration of the Spatiotemporal Effects of Laser Interaction with X-Pinches.[1] JAMES YOUNG, MATT EVANS, HANNAH HASSON, University of Rochester, ROMAN SHAPOVALOV, University of Michigan, IMANI WEST-ABDALLAH, University of Rochester, CHARLES SEYLER, Cornell University, PIERRE GOURDAIN, University of Rochester — X-pinches have been shown to be a source of extremely intense x-ray emissions useful for diagnosing plasma dynamics and imaging biological objects. The most striking feature of an x-pinch is the hotspot, the point source from where all the x-rays comes from. Unfortunately, the exact timing and location of the hotspot are still unpredictable. Since x-pinch hotspots form from instabilities (like an m=0 mode), we will computationally explore whether we can use a high-power laser to initiate the timing and location of these instabilities for a hybrid x-pinch setup. Our goal is to reduce the temporal and spatial jitter associated with the x-ray burst. Using an XMHD solver (PERSEUS), we explore the non-relativistic instability generation using a current profile of a 250kA LTD system and laser characteristics of SLAC's Matter in Extreme Conditions laboratory (MEC). Our results include both laser-penetration results using a boundary-defined EM-wave, and instability results from a power-deposition method.

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James Young
University of Rochester

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