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Study of Laser Ablation Plumes in 1-MA Z-Pinch Experiments¹ AUSTIN ANDERSON, ERIC DUTRA, ERIK MCKEE, CUYLER BEATTY, TIMOTHY DARLING, VLADIMIR IVANOV, PIOTR WIEWIOR, OLEK-SANDR CHALYY, ALEXEY ASTTANOVITSKIY, VIDYA NALAJALA, OLEG DMITRIEV, AARON COVINGTON, University of Nevada Reno — Laser ablation plumes have been explored as a vehicle for pinch experiments and pulsed neutron production at the NTF research facility. The laser ablation plume is generated by striking a target with a 20J, 0.8ns laser pulse from the Leopard laser. The plume is allowed to expand and then pinched by a 1 MA current generated by the Zebra pulsed power machine. The plume is compact and pre-ionized, offering an advantage over neutral gas puffs and wire arrays. When used with deuterated-polyethylene targets, pinched ablation plumes can generate a pulse of $~10^{11}$ neutrons with a 35 ns pulse width. A laser-based 532 nm Mach-Zender interferometer and 16 frame imaging with 5 ns temporal resolution are used to characterize plasma density and observe implosion dynamics. Cathode activation was also measured post shot and has been used to determine the deuteron currents produced in the shots. Results and discussion are presented.

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