

Abstract Submitted  
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**Optical Probe Measurements of a Plasma Channel for Fast Ignition** S. IVANCIC, D. HABERBERGER, W. THEOBALD, K.S. ANDERSON, D.H. FROULA, D.D. MEYERHOFER, Laboratory for Laser Energetics, U. of Rochester, K. TANAKA, H. HABARA, T. IWAWAKI, Osaka University — The evacuation of a cavity in a plasma by a high-intensity laser beam is of practical importance to the channeling fast-ignition concept. The channel in the plasma corona of an imploded inertial confinement fusion capsule provides a clear path through the plasma so that the energy from second high-intensity laser can be deposited close to the dense core of the assembled fuel to achieve ignition. This study reports on experiments performed with the OMEGA EP Laser System using one of the short-pulse IR beams (1.25 kJ, 10 ps) to form a straight channel in a large blowoff plasma with an electron temperature of  $\sim 1.5$  keV that was generated by two nanosecond, kilojoule UV laser beams. The channel was measured to reach up to half the IR critical density with a channel width of  $\sim 200$   $\mu\text{m}$ . Images were taken at different times showing the radial evolution of a strong blast wave from the channel walls. Individual filaments were observed at the critical surface indicating that the laser became unstable and broke up into multiple filaments. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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