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Study of laser-created laboratory plasma jets with soft x-ray laser interferometry JONATHAN GRAVA, MICHAEL PURVIS, JORGE FILEVICH, MARIO MARCONI, JORGE ROCCA, Colorado State University, JAMES DUNN, STEPHEN MOON, Lawrence Livermore National Laboratory, VYACHESLAV SHLYAPTSEV, University of California Davis at Livermore, COLORADO STATE UNIVERSITY TEAM, LAWRENCE LIVERMORE NATIONAL LABORATORY COLLABORATION, UNIVERSITY OF CALIFORNIA DAVIS AT LIVERMORE COLLABORATION — Jet-like plasma structures were generated by irradiating V-shaped Al targets at I=1×10^{12} W/cm^{2}with 0.8 J Ti:Sa laser pulses of 120 ps duration. A narrow plasma plume was observed to expand from the bottom of the cavity with Mach number $\sim$ 5. The plasma jet evolution was studied using soft x-ray laser interferometry (λ= 46.9 nm), allowing electron density measurements of the 1-mm plasma that exceeded 1×10^{20} cm^{-3}. Late in the evolution the jet expands laterally and develops sidelobes as it interacts with additional material expanding from the walls. The measurements were compared with 2-D simulations from the code HYDRA to gain understanding of the mechanisms that form the narrow plasma jet, including the role of radiation cooling. Measurements of similar jets generated by irradiating targets of different Z are under way Work sponsored by NNSA-SSAA DOE Grant # DE-FG52-060NA26152 and the U.S. DOE LLNL through ILSA contract No. W-7405-Eng-48.

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