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Dynamics of dense converging plasmas studied with soft x-ray laser interferometry JONATHAN GRAVA, MICHAEL PURVIS, JORGE FILEVICH, MARIO MARCONI, JORGE ROCCA, NSF ERC for Extreme Ultraviolet Science and Technology, CSU, JAMES DUNN, STEVE MOON, Lawrence Livermore National Laboratory, VYACHESLAV SHLYAPTSEV, University California Davis at Livermore, ELIZABETH JANKOWSKA, Wroclaw University of Technology, Wroclaw, Poland — Electron density maps of dense converging plasmas created by laser irradiation of semi-cylindrical targets at I = 1 x 10^{12} W/cm^2were obtained with soft x-ray laser interferometry. The plasma expands off the target surface converging in a focal region, creating a concentrated plasma where the electron density build-up exceeds 1 x 10^{20} cm^{-3}. The measurements were conducted using a 46.9 nm wavelength Ne-like Ar capillary discharge laser probe and a soft x-ray Mach-Zehnder interferometer based on diffraction gratings. The short wavelength of the probe beam enables the study of dense plasmas beyond the limitations of optical lasers. The measurements were compared with simulations obtained using the code HYDRA. Work sponsored by the NNSA-SSAA program through DOE Grant # DE-FG52-060NA26152 and the U.S. DOE Lawrence Livermore National Laboratory through ILSA, under contract No. W-7405-Eng-48.

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