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Photoionized Plasmas Created by Soft X-Ray Laser Irradiation of Solid Targets MARK BERRILL, FERNANDO BRIZUELA, BENJAMIN LANGDON, HERMAN BRAVO, CARMEN MENONI, JORGE J. ROCCA, Colorado State University, NSF ERC FOR EXTREME ULTRAVIOLET SCIENCE AND TECHNOLOGY TEAM — We report the first study of warm plasmas created by photoionization of solid targets with focused soft x-ray laser pulses, in which single photon photoionization is the dominant energy absorption mechanism. Laser pulses of 1 ns duration from a 46.9 nm capillary discharge laser were focused on low absorption (silicon), and high absorption (chromium, and silver) targets. The emitted plasma radiation was spectroscopically analyzed and compared to simulations using a 1 1/2 D hydrodynamic/atomic model. Spectra agree with simulations in showing that the Si plasmas are significantly colder and less ionized, confirming that in contrast to plasmas created by optical lasers the plasma properties are largely determined by the absorption coefficient of the target material. Work supported by the NNSA SSAA program through U.S. DOE Grant No. DE-FG52-06NA26152, using facilities from the NSF ERC Center for Extreme Ultraviolet Science and Technology, NSF Award Number EEC-0310717. M.B. was supported by DOE CSGF Grant No. DE-FG02-97ER25308.

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