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Direct Observation of Laser-driven Plasma Loader for Shockless Compression MU LI, GUANGHUA CHEN, XIUGUANG HUANG, JINTAO CAI, ZHUOWEI GU, SHOUXIAN LIU, HONGPING ZHANG, JIANHENG ZHAO, CHENGWEI SUN, SIZU FU, Institute of Fluid Physics, Chinese Academy of Engineering Physics — The objective of the current study tried to map out a whole procedure of laser-driven plasma jet and shockless compression of solid materials. The experiment was performed using the Shenguang-II Nd: glass laser. Transmitting and dumping of ablation shock wave in reservoir was recorded by a 2-channel line VISAR. Streaked and separated shade graph of plasma jet from rear surface of reservoir gave the plasma configuration and front speed (from 20km/s to 60km/s). A coaxial M-Z interferometer system measured density distribution at the front of plasma loader. It can be seen that the density distribution bulges downward near the front of the plasma jet, which is an important characteristic that determines shockless compression. And $10/20\mu$ m Al foil backed by 1mm LiF were compressed to 40GPa.

> Mu Li Institute of Fluid Physics, Chinese Academy of Engineering Physics

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