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Extremely high pressure generation by implosion plasmas with cone-in shell targets KEISUKE SHIGEMORI, YOICHIRO HIRONAKA, HIDEO NAGATOMO, SHINSUKE FUJIOKA, HIROYUKI SHIRAGA, MITSUO NAKAI, HIROSHI AZECHI, Institute of Laser Engineering, Osaka University, ATSUSHI SUNAHARA, Institute for Laser Technology, TOMOYUKI JOHZAKI, Hiroshima University, TOSHIHIKO KADONO, University of Occupational and Environmental Health, KATSUYA SHIMIZU, KYOKUGEN, Center for Quantum Science and Technology under Extreme Conditions, Osaka University — We propose a novel scheme to generate ultra-high pressure by using laser implosion plasma. Experiments were conducted at GEKKO-XII laser facility at ILE, Osaka University. Nine of twelve beams irradiated the cone-in shell targets. Fundamental experimental conditions were same as the typical fast ignition experiments. The targets were cone (Au)-in-CD shell, whose cone tip diameter was 100 μm. Aluminum or gold witness plates with small "hole" (diameter: 40$\sim$50 μm) were embedded onto the tip of the cone in order to measure shock breakout timings by a streaked optical pyrometer (SOP). The thickness and hole depth of the witness plates were 10 – 100 μm and 5 – 40 μm, respectively. From the time difference of shock breakout at the stepped witness plates, shock velocity was directly obtained. We estimated the pressure by the measured shock velocity and an extrapolation of previous EOS measurements.

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