Dynamic response of molybdenum to ultrafast laser induced shocks

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Molybdenum is a bcc transitional metal whose high-pressure behavior has attracted considerable experimental and theoretical interest. In the present paper chirped pulse interferometry was applied to study ultrafast shock waves evolution with 1 ps temporal resolution in molybdenum submicron film samples under loading up to 40 GPa created by a femtosecond laser. The new data on Hugoniot elastic limit on a submicron propagation distance and shear stress was obtained. Also the spall strength of molybdenum in a condense state at the strain rate of \(10^8\) \(\text{c}^{-1}\) was estimated and morphology of damage was investigated using scanning electron microscopy.