

## Ultrasonic bulk imaging of shock wave spatial distribution in opaque solids

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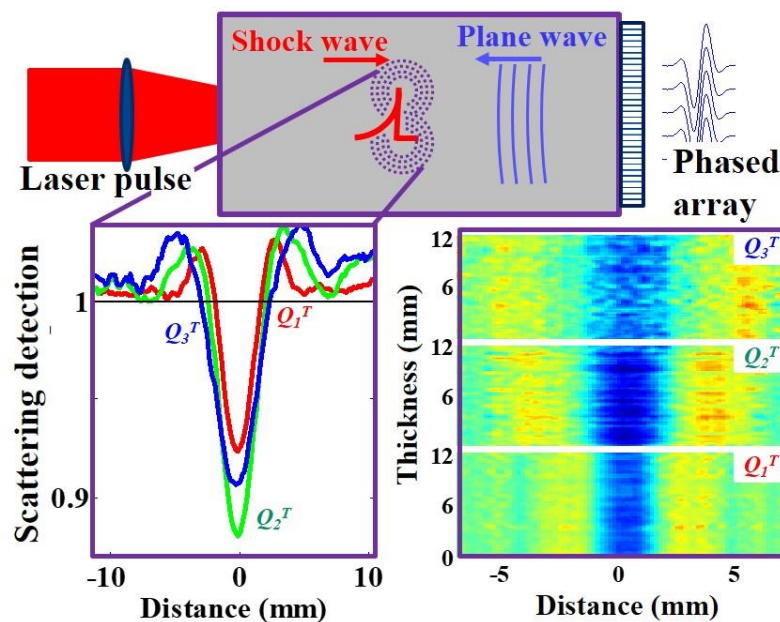
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We present a method to image the bulk propagation of a laser-driven shock wave in a thick, opaque metallic plate by measuring the scattering of an elastic plane wave at one of its interfaces. The shock wave is generated by *ns* laser-loading and the elastic plane probe wave, contra-propagative with respect to the shock, is emitted by means of a phase-array device. The time-space detection of the probe wave allows building the movie of the shock propagation in the opaque structure. Applications range from fundamental wave science to laser-loading material science. [1]

[1] M. Ducouso, E. Cuenca, M. Marmonier, L. Videau, F. Coulouvat and L. Berthe, *Bulk Probing of Shock Wave Spatial Distribution in Opaque Solids by Ultrasonic*, Phys. Rev. Applied, **15**, p. L051002 (2021).



Top : Principles of experiments ; Down-left : Space-resolved detection on the phase array of the scattering of the probe elastic plane wave on the shock ; Down-right : Shock propagation imaging in the bulk of a thick metallic plate.