

## Femtosecond X-ray Diffraction Studies of the Reversal of Plastic Deformation during Shock Release of Tantalum

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While *in situ* diffraction has proved extremely useful in studying dynamic compression, there have been relatively few experiments investigating shock materials on release. We extend our previous work on plasticity mechanisms in shock compressed fibre-textured tantalum to study reversed plastic deformations on release. By exploiting the extremely bright femtosecond X-ray pulses available on the MEC beamline at LCLS, we are able to characterise release wave-profiles by use of diffraction measurements, and compare these results with molecular dynamics simulations.