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Increasing Data from High Rate Characterization Experiments using Optical Reconstruction CLIVE SIVIOUR, MATTHEW ARTHINGTON, EUAN WIELEWSKI, NIK PETRINIC, University of Oxford — Uniaxial characterization experiments in tension and compression are widely used to evaluate the mechanical response of materials to applied deformation over a wide range of strain rates. For many materials, specimens with initially circular cross sections will evolve to become elliptical. There is an opportunity to more fully characterize such materials by reconstructing the elliptical shape during the deformation process. This also allows us to better evaluate the stress and strain in the specimen during deformation. We have developed a technique whereby images of a specimen during deformation (for example, from a high speed camera) from three different angles are used to reconstruct its cross section during an experiment. The technique has been applied to tensile Hopkinson bar experiments and Taylor Impact experiments on hcp materials. This paper presents an overview of the technique and the data that it can provide.

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