Simplified Shock Conditions for Finite Elastoplasticity

BRADLEY PLOHR, JEEYEON N. PLOHR, Los Alamos National Laboratory — In this talk, we consider shock loading of an elastoplastic material; the strain is not restricted to be small. We show how to reduce the Rankine-Hugoniot jump conditions to a simplified form analogous to that used in fluid dynamics. Just as for fluids, the shock conditions can be separated into a thermodynamic condition (the Hugoniot condition), a condition determining the velocity, and a condition determining the strain, which can be solved sequentially to determine the shock wave.