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Jones-Wilkins-Lee Product Equations of State for Overdriven PETN Detonation CRAIG TARVER, Lawrence Livermore Natl Lab — **T**he Jones-Wilkins-Lee (JWL) equation of state (EOS) for detonation reaction products mixtures has long been used to quantitatively calculate the shock Hugoniot states of unreacted energetic materials plus the Chapman-Jouguet (C-J) detonation state and subsequent expansion states of the reaction products. JWL EOS's also quantitatively calculate the shock Hugoniot states of the reaction products at higher pressures than C-J created in piston compaction, multiple shock, and converging wave experiments. Early JWL EOS's fit to only detonation and expansion states were shown to be too compressible to predict experimentally measured overdriven detonations over 30 years ago. A revised JWL fitting method was devised and has been used since. JWL EOS's can now be generated using the CHEETAH chemical equilibrium code. These JWL EOS fits to CHEETAH C-J and reaction product expansion states closely match experimentally measured overdriven product Hugoniot states for many explosives. This paper presents experimental results and CHEETAH JWL EOS product predictions for overdriven detonation waves in PETN. This work was performed under the auspices of the United States Department of Energy by the Lawrence Livermore National Laboratory under Contact DE-AC52-07NA27344.

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