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The Preston-Tonks-Wallace Model Parameterization of FCC-Cerium JEEYEON PLOHR, LEONID BURAKOVSKY, SKY SJUE, Los Alamos National Laboratory — Cerium (Ce) is a scientifically interesting material for which there are seven allotropies; it goes through phase transformation between alpha and gamma phases via localization/delocalization of f electron with a large volume collapse; the liquid phase has a larger volume than solid phase in low pressure regime (less than 3GPa), and it has a critical point at low pressure/temperature (475K, 1.5 GPa). As part of an effort to have a better material model parameters for Ce, we have fitted the Preston-Tonks-Wallace (PTW) viscoplasticity model. In doing so, we have used a thermoelasticity model that provides the analytic expressions of shear modulus and melt curve. The experimental data needed were provided by Russian Federal Nuclear Center (RFNC) where the split Hopkins bar tests were performed for seven sets of strain rate and temperature regimes from which stress-strain data were extracted, and we have used them to find the best fitting PTW model parameters. However, due to the lack of large strain data, there remains a big uncertainty in selecting the parameters.

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