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Computational Comparisons of Statistical Descriptions of a Tungsten Alloy Subjected to Explosive Loading MICHAEL HOPSON, Naval Surface Warfare Center Dahlgren Division, DAVID LAMBERT, Air Force Research Laboratory, Munitions Directorate — Computational continuum codes can provide many details on the response of metals to explosive loading. However, most "production" level calculations use a homogeneous description of the metal. This is an incorrect representation since metals possess a microstructure whose details create variations in material strength and other properties. Ultimately these variations influence the formation of fragments at the macroscopic level. The spatial scale of the microstructure is on the order of micrometers and is not readily accessible to current computational tools and resources for system level calculations. In this analysis, a Weibull distribution was applied to the yield stress of a tungsten alloy. This material was explosively loaded in a series of tests and the fragments were soft captured using a water tank. The distribution of initial yield stress was varied parametrically in order to determine the accuracy of this technique. Then the optimal distribution was kept constant and the seed value was varied in order to produce different realizations of the same material. Comparisons to test data are made.

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