

Abstract Submitted
for the SHOCK09 Meeting of
The American Physical Society

Impact Response of Pure Iron Between 150 and 1273 K EUGENE ZARETSKY, Ben Gurion University — Yield and spall strengths of pure polycrystalline iron (99.995% Fe) were studied in a series of VISAR-monitored planar impact experiments with initial sample temperature ranged from 150 to 1273 K. It was found that decaying with temperature yield strength of α -iron has two local maxima; the first one in the vicinity of the iron Curie point, 1030 K, and the second one just below the temperature of the $\alpha - \gamma$ transition in iron, 1180 K. It was also found that both the pressure and the volume effect of the shock-induced $\alpha - \varepsilon$ transformation (revealed by the two-wave structure of the recorded waveforms) decrease with the test temperature achieving their minima in the vicinity of the $\alpha - \gamma$ transformation. Heating of the iron above the temperature of the $\alpha - \gamma$ transformation is accompanied by the increase of both the $\alpha - \varepsilon$ transformation pressure and its volume effect.

Eugene Zaretsky
Ben Gurion University

Date submitted: 11 Feb 2009

Electronic form version 1.4