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**Meso-scale modelling of the heat conductivity effect on the shock response of a porous material** A.D. RESNYANSKY, Weapons and Combat Systems Division, DST Group, PO Box 1500, Edinburgh SA 5111, Australia — Understanding of deformation mechanisms of porous materials under shock compression is important for tailoring material properties at the shock manufacturing of advanced materials from substrate powders and for studying the response of porous materials under shock loading. Numerical set-up of the present work considers a set of solid particles separated by air representing a volume of porous material. Condensed material in the meso-scale set-up is simulated with a viscoelastic rate sensitive material model with heat conduction formulated from the principles of irreversible thermodynamics. The model is implemented in the CTH shock physics code. The meso-scale CTH simulation of the shock loading of the representative volume reveals the mechanism of pore collapse and shows in detail the transition from a high porosity case typical for abnormal Hugoniot response to a moderate porosity case typical for conventional Hugoniot response. Results of the analysis agree with previous analytical considerations and support hypotheses used in the two-phase approach.

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