Structure of elastoplastic shock wave in porous copper on the partial pores compaction limit

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We present a simulation of stationary shock waves in a porous copper in a moving coordinate system, which adjusting the velocity of simulation box/window to establish a desired position of shock front. We demonstrate that this newly developed technique, called adapative moving window (AMW), can be applied for very weak shocks, and it converges to a steady regime faster than previously developed one [1, 2]. The AMW demonstrated it effectiveness in simulation of the front structure for weak shocks in the porous copper near the yield strength of bulk copper. The porous copper is studied in case of pores positioned inside the nodes of periodical lattices. In particular the mechanism of partial pore collapse is clarified for weak shocks below a knee on the calculated shock Hugoniot, where this knee is associated with a complete collapse of pores. The simulation shows that the strength of porous copper occurs dependence on the pores shape and the direction of the shock wave propagation.

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[2] Murzov S, Parshikov A, D'yachkov S, Egorova M, Medin S and Zhakhovskii V 2021 *High Temperature* **59** 230–239