

Abstract Submitted
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Influence of Equation of State on Results of Hypervelocity Impact Modeling¹ I.V. LOMONOSOV, V.E. FORTOV, V.V. KIM, A.V. MATVEICHEV, A.V. OSTRIK, IPCP RAS — The numerical modeling of hypervelocity impact has been done with the use of method of “individual particles in cells.” We carried out calculations using multi-phase and simplified caloric equations of state (EOS) in 3D setup for spherical lead impactor penetrating flat lead plate with a velocity of 6.6 km/s. This impact velocity correspond to melting in shock wave and to strong epeporating in release wave. Processes of crater and debris cloud formation and their dynamics have been investigated. Results of numerical modeling, such as density distribution in inner space, form and spatial size of debris cloud have been compared with experimental x-ray shots. We found that parameters of gas dynamic flow, such as pressure and density, are different for cases of multi-phase and caloric EOS. One should note that both EOS describe shock-wave data with good accuracy. The analysis proved that the quality of modeling results significantly depends on used equation of state.

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