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International Shock-Wave data base

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In this work, we announce the start of a new project: International Shock-Wave data base (ISWdb). Shock-wave and related dynamic material response data serve for calibrating, validating, and improving material models over very broad regions of the pressure–temperature–density phase space. Measurements of principal, reflected and porous Hugoniots, and determinations of release isentrope parameters cover a broad range of the phase diagram. This unique information embraces nine orders with respect to pressure and five orders with respect to density. All of the data are unique, have their own history and result from complicated expensive experiments. As a follow-on to our current on-line database (http://www.ficp.ac.ru/rusbank/), the ISWdb will include the approximately 20000 experimental points on shock compression, adiabatic expansion, measurements of sound velocities behind the shock front and free-surface-velocity profiles for more than 650 substances that we previously collected. The ISWdb project objectives are: (i) to develop a database on properties of materials under conditions of shock-wave and other dynamic loadings, selected related quantities of interest, and the meta-data that describes the provenance of the measurements and material models; and (ii) to make this database available internationally through the Internet, in an interactive form. The development and operation of the ISWdb will be guided by an advisory committee. The database will be installed on two mirrored web-servers, one in Russia and the other in USA. The database will provide access to original experimental data on shock compression, non-shock dynamic loadings, isentropic expansion, measurements of sound speed in the Hugoniot state, and time-dependent free-surface or window-interface velocity profiles. Users will be able to search the information in the database and obtain the experimental points in tabular or plain text formats directly via the Internet using common browsers. It will also be possible to plot the experimental points for comparison with different approximations and results of equation-of-state calculations. The user will be able to present the results of calculations in text or graphical forms and compare them with any experimental data available in the database. Our goal is to make the ISWdb a useful tool for the shock-wave community. This talk is intended to solicit your feedback and interest in submitting your experimental results to the ISWdb, as well as present an overview of the project.

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