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**Strongly Coupled Plasma Shock Compression**

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The behavior of matter at extremely high pressures is of high principal interest for understanding the structure and evolution of astrophysical objects and many energy, nuclear and chemical technologies. Dynamics methods of generation of extremely high pressures in dense plasma, based on the compression and nonreversible heating of matter in intensive shock waves and waves of adiabatic discharge, are considered. To generate shock waves in the megabar pressure range the cylindrical and spherical condensed high explosives, laser and corpuscular beams, high velocity impacts, and soft X-rays were used. The highly time-resolved diagnostics of the extreme states of plasma were carried out with differential laser indicators of velocity, fast acting electron-optical transducers, pyrometers, and high-speed spectrometers equipped with the electron-optical transmission lines. The experimental data obtained and the physical models of behavior of plasma at extremely high pressures, temperatures and deformation rates are discussed. These are the metallization and dielectrization of strongly compressed matter, high temperature thermodynamics and phase transitions, deformation of energy spectrum of compressed atoms and strength and elastic-plastic phenomena, kinetics of phase transitions. We analyzed the shear viscosity of matter as an indicator of particles correlations in a broad region of parameters from Plank's scale to laboratory conditions. Wide-range semi-empirical equations of state and models are constructed, which were used for multidimensional numerical simulation of pulsed high-energy processes.