Determination of pulsed magnetic system parameters from conditions of controllable high-strain rate uniaxial tension and fracture of materials

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Magnetic pulse loading is a proven and effective method for testing materials, the main advantages of which are high energy density of the magnetic field and the ability to generate controlled pressure pulses in the microsecond range for various loading schemes. Magnetic pulse method allows to study material behavior in extreme mechanical loading modes that is important for development of electrophysical apparatus, study of electrophysical processes or study of properties of different materials including materials with memory effect (NiTi).
Based on the analysis of experimental data, as well as analytical and numerical simulation of the process of high strain rate uniaxial tension, an algorithm was formulated for determining the parameters of the magnetic system to obtain a given strain rate (up to 10^5 s^{-1}), which provides enough data to verify plasticity and fracture models in a wider range of influences.