

Compression of a solenoid by a converging cylindrical detonation wave

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Magnetic flux compression generators using explosives (explosives) are devices that convert part of the energy contained in explosive explosives into electromagnetic field energy. Due to the high power and high pressure generated by explosives, these devices have found wide application as switching power sources and generation of ultra-high magnetic fields, especially where weight and volume are limited. In this work, using a laboratory installation with a small explosive charge (less than one kilogram), the possibility of axisymmetric compression of a copper solenoid was demonstrated. The use of specially developed multipoint initiation modules made it possible to obtain a smooth converging cylindrical detonation wave. The minimum number of inhomogeneities of such a wave when it reaches the surface of the coil makes it possible to achieve high-quality axisymmetric compression and, as a result, a significant predicted increase of the magnetic flux.