Dynamics of implosion of wire array onto deuterated TaRGET

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The implosion of wire array on the internal deuterated cylinder was investigated on the Angara-5installation (3.5 MA, 100 ns). The a arrays of various configurations with diameter of 12 and 20 mm were made on the basis of aluminum wires and graphite fibers with a diameter of   
15 and of 30 µm, the mixed arrays consisting of aluminum wires and nylon wires with a diameter of 25 microns and arrays from nylon wires with dusting of aluminum 1 micron thick were used. The quantity of wires changed from 10 to 30. The internal cylinder was made of deuterated polyethylene with density of 0.045–0.3 g/cm3 and with a diameter of 1–3 mm. For measurement of parameters of plasma in Z-pinch 10 frame camera (the exposure frame 2 ns), an optical streak camera, the time -integrated x-ray pinhole camera, vacuum photoemission detectors, a crystal spectrograph, neutron detectors were used. It was established that dynamics of implosion of plasma, formation of the hot spots which are sources of neutrons depends on configuration of load: diameter of arrays, quantity of wires (fiber), diameter and density of the deuterated cylinder. The most efficient compression and high parameters of plasma ( compression ratio, temperature), and also the maximum neutron output (2.6 × 1010) was observed in experiments with the array with a diameter of 12 mm executed from aluminum wires in which the deuterated cylinder with a diameter of 1 mm with a density of 0.07 g/cm3 was located.