Study of compression of a deuterated target placed inside a fiber liner [[1]](#footnote-1)\*)

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At the Angara-5-1 installation (3.5 MA, 100 ns), the compression of fiber arrays on a deuterated target was studied. We used cylindrical arrays of various configurations with an initial diameter of 12 mm, made on the basis of polypropylene fibers with a diameter of 14.3 microns. The number of fibers varied from 30 to 120. The inner cylindrical target with a density of 0.15 - 0.2 g / cm3 and a diameter of 1 mm was made of deuterated polyethylene (80%) mixed with agar-agar (18%) and with the diagnostic additive KOH (2%) . To measure the plasma parameters in the Z-pinch, a 10-frame ultra-high-speed, optical streak cameras, integrated X-ray pinhole camera, vacuum X-ray diodes, a crystal spectrograph, and neutron detectors were used. It was found that the dynamics of plasma compression, the occurrence of local plasma formations, which are sources of neutrons and soft X-rays in the region> 750 eV, depends on the load configuration: the number of fibers, the diameter and density of the deuterated target. The most effective compression and high plasma parameters (compression ratio, temperature), as well as the highest neutron yield (8 × 109) were observed in experiments with arrays with a diameter of 12 mm, and the number of fibers 60, inside which a deuterated target with a diameter of 1 mm and a density of 0.2 g/ cm3 was placed. In experiments with thin polypropylene fibers, by the time local structures were formed, the fiber material was converted to plasma under the influence of a flowing current. The electron temperature and density in local plasma formations, respectively, were Te≈1021cm-3 and ne≈1 keV. The average neutron energy was 2.5 MeV.

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVII/It/ru/CW-Alexandrov.docx) [↑](#footnote-ref-1)