

Abstract Submitted
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Long-Impllosion-Time Z-pinch Experiments with Deuterium Gas-Puffs on the GIT-12 Generator¹ D. KLIR, P. KUBES, K. REZAC, J. CIKHARDT, J. KRAVARIK, Czech Technical University in Prague, A. SHISHLOV, A. LABETSKY, F. FURSOV, V. KOKSHENEV, B. KOVALCHUK, N. KURMAEV, N. RATAKHIN, IHCE in Tomsk — Experiments with deuterium triple shell gas-puffs have been carried out on the GIT-12 generator at the IHCE in Tomsk. Outer, middle, and inner nozzle diameters were 160 mm, 80 mm and 30 mm, respectively. The influence of the mass of deuterium shells on neutron emission times, neutron yields and neutron spectra was studied. The linear mass density of deuterium varied between 50 and 270 $\mu\text{g}/\text{cm}$. Gas puffs imploded onto the axis before the peak of a generator current at 700-1100 ns. The first neutron peak occurred during the stagnation. Most of the neutrons were emitted during the second neutron pulse after the development of instabilities. In lower mass gas puffs, neutron energies of up to 4.4 MeV gave the evidence of 1 MeV deuterons. The peak neutron yield from $\text{D}(\text{d},\text{n})^3\text{He}$ reactions reached 3×10^{11} on a current level of 2.5 MA. Secondary DT neutrons were measured by BDS-10000 bubble detectors. An average neutron yield ratio $Y_{>10\text{MeV}}/Y_{2.5\text{MeV}}$ exceeded $(6 \pm 3) \times 10^{-4}$. Ne-Ne-D₂ and Ne-D₂-D₂ gas puffs produced 3 times lower neutron yields but the first neutron pulse during the stagnation was nearly the same as with D₂-D₂-D₂ gas puffs.

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