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Diagnostics of Fast Axial Ions Produced in Deuterium Gas-Puff Z-Pinch[1] K. REZAC, D. KLIR, J. CIKHARDT, P. KUBES, O. SILA, J. KRAVARIK, FEE CTU in Prague, A.V. SHISHLOV, A.YU. LABETSKY, R.K. CHERDIZOV, N.A. RATAKHIN, IHCE in Tomsk, H. ORCIKOVA, K. TUREK, Nuclear Physics Institute, ASCR, N. DUDKIN, V.N. PADALKO, National Research Tomsk Polytechnic University, GIT-12 TEAM — An unexpected advantage of some Z-pinch configurations is a possibility of an acceleration of ions to high energies. One of these configurations is a deuterium gas-puff with outer plasma shell, where hydrogen ions with energies up to 40 MeV has been observed during Z-pinch experiments on the GIT-12 generator since 2013. During the recent campaign in 2016, the source of high energetic ions and also parameters of ion pulses have been studied by various in-chamber diagnostics in 24 experimental shots on the current level below 3 MA. Principal aims were (i) to find a spatial distribution of ion sources, (ii) localization of ion sources on the z-axis and (iii) determine the ion energy spectra by an unfold technique. All of these has been done with the help of a new diagnostic setup consists of an ion pinhole camera, an ion 3-pinhole camera, a multi-pinhole camera and a detector of spatial ion beam profile. The ion diagnostics contained stacks with various absorbers, CR-39 track detectors, HD-V2 and EBT-3 radio-chromic films. One more aim, (iv) the study of a difference in production time of axial ion pulses with off-axis pulses, were accomplished by LiF samples and nTOF signals.

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