

Abstract Submitted
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Study of plasma parameters in expanders of the Gas Dynamic Trap (GDT) E. SOLDATKINA, M. KORZHAVINA, Budker Institute of Nuclear Physics, 630090, Novosibirsk, Russia, A. DUNAEVSKY, Tri Alpha Energy Inc., V. PRIKHODKO, V. SAVKIN, P. BAGRYANSKY, Budker Institute of Nuclear Physics, 630090, Novosibirsk, Russia — Recent advances in GDT¹ demonstrate the possibility of electron temperatures (T_e) of above 1 KeV in mirror machines.² Such high T_e can be reached if electron heat losses to end walls are limited. Understanding plasma parameters and potential distribution in expanders, common features in GDT and advanced FRCs at Tri Alpha Energy, is crucial for their efficiency. This poster reviews studies of plasma parameters in GDT expanders at on-axis T_e of 300-600 eV. Diagnostics includes Langmuir probes, emissive probes, RPAs, and bolometers. Within few centimeters of the end plates, electron energies of ~ 25 eV and plasma potentials of several volts are observed. High potential drops are absent in the sheaths, indicative of the role of cold trapped electrons on the potential profiles. New results agree with prior studies at substantially lower on-axis T_e . Scaling of plasma parameters with on-axis T_e will be reported. This work was supported by the Ministry of Education and Science of Russia (project RFMEFI61914X0003).

¹A.A.Ivanov and V.V.Prikhodko, Plasma Phys Control. Fusion 55 (2013) 063001

²P.Bagryansky et al, PRL 114 (2015) 205001

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