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**GDT Experiments with Electron Heating**

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Recent results[2] from the Gas Dynamic Trap (GDT) experiment in Novosbirsk, Russia have achieved Thomson scattering measured electron temperatures of 600 to 750 eV, well above previous highest values of 250 eV in any mirror system. These new experiments thus demonstrate there is no fundamental low electron temperature restriction. In fact, the attained electron temperatures are sufficient for a 14 MeV D-T fusion neutron source for fusion materials evaluation and qualification. The linear GDT device, with extensive diagnostics, employs circular axisymmetric magnets with a high mirror ratio of 33. MHD stability, up to 60% beta, is achieved by vortex radial flow shear aided by plasma outflow in the good curvature end regions. Heating is with 5 MW of neutral beams injected at 45 degrees augmented at lower densities by a MW of electron cyclotron heating. Importantly, the end wall magnetic field (relative to the mirror field) was reduced by a factor exceeding the square root of the ion-to-electron mass ratio, as suggested by theory. This talk will concentrate on the basic plasma physics understanding, puzzling aspects and future challenges associated with this interesting plasma experiment.

[1]In collaboration with the GDT Group.

[2]P.A. Bagryansky et. al., Nuc. Fusion 54 (2014)082001 and A.V. Anikeev et.al., at the OS2014 Conference, Taejon Korea, August 26-29, 2014 to be published.