Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Drift Waves in the GAMMA-10 and Kinetically Stabilized Tandem Mirror J. PRATT, W. HORTON, H.L. BERK, UT Austin, IFS, T. CHO, Plasma Research Centre, Univ. of Tsukuba — The tandem mirror remains an attractive magnetic confinement geometry. The absence of toroidal curvature and internal plasma parallel current gives the system strongly favorable stability and transport properties. Additionally, GAMMA-10 experimental results demonstrate that sheared rotation can suppress turbulent radial losses. We analyze electrostatic drift wave eigenmodes for two machines: the GAMMA-10 (Cho, *et al.*, Nuclear Fusion 45 (12), 2005) and the Kinetically Stabilized Tandem Mirror reactor (Post *et al.*, Fusion Science and Technology, 47 (49) 2005). We compare results with experimental data from the GAMMA-10. Recent achievements of this machine include 3 keV ion confinement potentials and $T_e > 500$ eV. The implications of drift waves results on radial confinement times developed using Bohm, gyro-Bohm, and electron temperature gradient (ETG) scalings in Pratt and Horton (Phys. Plasmas (13), 2006) are discussed. The plug mirrors create an ambipolar potential that controls end losses; radial losses are driven by drift wave turbulence that controls the electron temperature profile through radial transport. Total energy confinement times for the GAMMA-10 experiment are significantly larger than corresponding empirical confinement times in toroidal devices. We conclude that the tandem mirror has a qualitatively different form of drift wave radial transport from that in toroidal devices. *Work supported by the Department of Energy Grant DE-FG02-04ER5474.

J. Pratt
UT Austin, IFS

Date submitted: 21 Jul 2006 Electronic form version 1.4