Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Geodesic Acoustic Mode Structure in DIII-D[1] G. WANG, W.A. PEEBLES, T.L. RHODES, J.C. HILLESHEIM, E.J. DOYLE, L. SCHMITZ, L. ZENG, UCLA, M.E. AUSTIN, U. of Texas, Z. YAN, G.R. MCKEE, U. of Wisconsin, R. NAZIKIAN, C.C. PETTY, K.H. BURRELL, S. SMITH, General Atomics, M.J. LANCTOT, Lawrence Livermore National Library — Geodesic Acoustic Modes (GAMs) are coherent flows induced by plasma turbulence that in turn affect the turbulence and turbulent transport. Recently, in a neutral beam and electron cyclotron heated L-mode plasma in the DIII-D tokamak, strong GAM oscillations have been observed in electron temperature fluctuations $\tilde{T}_e$ in addition to the often-observed GAM density fluctuations. The mode frequency is constant over a radial range ($\delta\rho \sim 0.2$), as expected of an eigenmode, with two different frequencies observed depending upon radius. Both modes exist at the location where one frequency transits to another as detected in $\tilde{T}_e$. GAM oscillations in density and ExB flow peak at far edge (at $\rho \sim 0.9$) and have similar profile shapes. In contrast, the GAM oscillations in $\tilde{T}_e$ peak much deeper into plasma (at $\rho \sim 0.7$). After the auxiliary heating power is turned off for $t \geq 100$ ms, the eigenmode feature evolves into a continuum. This observation of GAM properties may provide challenges for existing theories to understand GAMs and plasma turbulence.

[1]This work was supported in part by the US DOE under DE-FG02-08ER54984, DE-FG03-97ER54415, DE FG02 08ER54999, DE-FC02-04ER54698, DE AC52 07NA27344

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Date submitted: 13 Jul 2012 Electronic form version 1.4