Abstract Submitted for the 54th Annual Meeting
Division of Plasma Physics
October 29 through November 2, 2012
Providence, Rhode Island

Category Number and Subject:

[ ] Theory [**X**] Experiment

Geodesic Acoustic Mode Structure in DIII-D[*], G. Wang, W.A. Peebles, T.L. Rhodes, J.C. Hillesheim, E.J. Doyle, L. Schmitz, L. Zeng, *UCLA*; M.E. Austin, *U. Texas*; Z. Yan, G.R. McKee, *U. Wisc.*; R. Nazikian, C.C. Petty, K.H. Burrell, S. Smith, *GA*; and M.J. Lanctot, *LLNL* - 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. At the location where one frequency transits to another, both modes exist, as detected in $\tilde{T}_e$. GAM oscillations in density and $E \times B$ 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 $\rho \sim 0.7$). Interestingly, after the auxiliary heating power is turned off for $t \geq 100$ ms, the eigenmode feature evolves into a continuum, i.e., mode frequencies vary with radius. This detailed observation of GAM properties may provide challenges for existing theories for the understanding of GAMs and plasma turbulence.

*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.