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Geodesic Acoustic Mode Measurements in DIII-D[1] J.C. HILLESHEIM, W.A. PEEBLES, T.A. CARTER, T.L. RHODES, L. SCHMITZ, UCLA, DIII-D TEAM — Geodesic acoustic modes (GAMs) are nonlinearly driven, axisymmetric ($m = 0$, $n = 0$) $E \times B$ flows, which may play an important role in establishing the saturated level of turbulence in tokamaks. Doppler backscattering (DBS) measures the flow of turbulent structures and the level of intermediate-k ($k_\perp \rho_s \sim 1-4$) density fluctuations. Measurements have been made with multichannel DBS systems at toroidal locations separated by 180°. Both linear characteristics of the mode and its nonlinear interactions have been studied. Observations include cases where the GAM exists as a persistent mesoscale structure, coherent over ∼1/3 of the minor radius; measurements in repeat shots indicate a poloidal dependence of the GAM's radial wavenumber; and bicoherence analysis between the toroidally separated DBS systems has revealed a relationship between the GAM and low frequency zonal flows.

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