Experimental constraint on the radial mode number of the Geodesic Acoustic Mode in MAST Ohmic plasma

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Reciprocating Mach probe data is used to estimate the radial wave number of oscillatory zonal flows in Ohmic MAST plasma. An intermittent ~10 kHz mode, previously identified as a Geodesic Acoustic Mode (GAM), is detected in the wavelet decomposition and windowed spectra of plasma potential fluctuations of the MAST tokamak edge plasma. Two-points phase differencing technique is then applied to probe pins with radial and poloidal separations giving an estimate of the radial wave number at the desired range of frequencies. The phase velocity of propagation and an estimate of the shearing rate of the GAM is obtained. We measure the radial mode number range $kr \sim 0.3\text{-}1.0$ 1/cm and a radial propagation speed of up to ~1 km/s. The GAM shearing rate is an order of magnitude smaller than the growth rate of drift-like turbulence. These results are consistent with the estimates obtained previously from multi-fluid numerical simulations of GAM in MAST.