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Nonlinear Evolution and Radial Propagation of the Energetic Particle-Induced Geodesic Acoustic Mode*

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The injection of counter passing neutral beam ions in high qmin discharges on DIII-D is known to excite intense Geodesic Acoustic Modes or GAMs. Previous studies have identified the fundamental nonperturbative characteristic of this mode and the role of the beam ions in determining the mode frequency (tied to the bounce frequency of the beam ions) and the radial scale length (tied to the orbit width of the beam ions). A property of the saturated state of the E-GAM is its radial propagation. At large radius the mode propagates outward towards the plasma edge, however at small radius the mode also appears to propagate inward to the core, with a region that looks like a standing wave at intermediate radius. The inward radial propagation appears to be localized to the region of strong shear reversal. Comparisons will be presented of the observed mode amplitudes, growth rates and radial propagation characteristics of the E-GAM with nonlinear simulation using an electrostatic particle simulation code.

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