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Energetic Particle-induced Geodesic Acoustic Mode[1] GUOYONG FU, Princeton University — A new energetic particle-induced Geodesic Acoustic Mode (EGAM) is shown to exist. The mode frequency, mode structure, and mode destabilization are determined non-perturbatively by energetic particle kinetic effects. In particular we find the EGAM frequency is substantially lower than the standard GAM frequency. The radial mode width is determined by the energetic particle drift orbit width and can be fairly large for high energetic particle pressure and large safety factor. These results are consistent with the recent experimental observation of the beam-driven n=0 mode in DIII-D. The new mode is important since it can degrade energetic particle confinement as shown in the DIII-D experiments. The new mode may also affect the thermal plasma confinement via its interaction with p lasma micro-turbulence.

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