

Abstract Submitted
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Geodesic Curvature Effects in the WCMs¹ TIANCHUN ZHOU,
Harbin Institute of Technology — The favorable features of the steady state I-Regime [1,2] discovered on Alcator C-Mod recently make this regime a hopeful working regime for future burning plasma experiments. Accompanying the I-regime are the weakly coherent modes (WCMs)[1,2] with frequency around 200 kHz that propagate poloidally in the electron diamagnetic drift direction in the lab frame. The WCMs were interpreted [3,4] as certain type of heavy impurity modes in the 3-fluid framework in a 1-D plane magnetic field geometry. Once considering in a simplified toroidal magnetic field geometry, the geodesic curvature will play important roles in that the contribution of the geodesic compression may catch up with or outweighs that of the parallel compression in the plasma edge region where the fluctuations are highly localized. This geodesic coupling to the neighboring bands modifies the marginal stability condition and mode profiles in Refs.[3,4]. In the same framework, attempts will be made to interpret the concomitant low frequency ($\sim 20\text{kHz}$) fluctuations as a type of impurity drift wave-like modes propagating in the ion diamagnetic drift direction.

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