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Convective radial energy flux due to RMPs at the tokamak plasma edge F. ALBERTO MARCUS, PETER BEYER, GUILLAUME FUHR, ARNAUD MONNIER, SADRUDDIN BENKADDA, Aix-Marseille University — Transport barriers in tokamak edge plasmas are typically unstable and exhibit quasi-periodic relaxation oscillations associated with high energy flux peaks known as Edge Localize Modes (ELMs). The efficiency of ELMs control by RMPs is enhanced when the RMP amplitude is increased, which is generally attributed to field line stochastisation, induced by overlapping of magnetic islands, and it is due to a reduction in pressure gradient by a radial energy flux. Although the experiments confirmed RMPs as an important tool to control barrier relaxations, the mechanisms of how they work are not well understood, in particular if the penetration is sufficient to produce stochasticity. Here we study an additional mechanism leading to convective radial flux even in the absence of stochasticity.This new mechanism is based on the coupling between electrostatic potential and pressure via magnetic curvature, also leading to poloidal $E \times B$ flow generation.By using the 3D toroidal electromagnetic edge turbulence code EMEDGE3D, we consider cases where the total heat flux and the corresponding pressure gradient are below the micro-instability limit. We analyze the effects of the RMP intensity on the convective energy flux and the pressure gradient profile on perturbed magnetic surfaces.

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