

Abstract Submitted
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A turbulent dynamo: Generation of zonal magnetic fields by finite beta drift-ballooning modes in tokamak plasmas¹ ROBERT KLEVA, PARVEZ GUZDAR, IREAP, University of Maryland, College Park, MD, USA — The generation of zonal flows and zonal magnetic fields can play a significant role in regulating the transport in the edge region of tokamaks. In recent years the focus has been on zonal flows since they are believed to be responsible for initiating good confined modes observed in a variety of magnetic confinement devices. Here we address the generation and saturation of zonal magnetic fields by numerically solving a set of reduced Braginskii equations in a flux-tube geometry. It is shown that the dynamo action leads to the generation of these fields which yields a time-dependent saturated state in which the turbulent drive balances the classical resistivity. The magnitude of the zonal field is however quite small compared to the zonal flow. We will make comparisons from our simulations with recent measurements of zonal fields.

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