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Interaction between magnetic island and electrostatic turbulence FULVIO MILITELLO, Institute for Fusion Studies - CMPD, RICHARD FITZ-PATRICK, FRANCOIS WAELBROECK, Institute for Fusion Studies — The interaction between electrostatic turbulence and a magnetic island is investigated numerically. The physical model used is a 2-D version of the Hasegawa-Wakatani equations extended to include a curvature term and to account for the presence of a magnetic island. This is the simplest model of electrostatic turbulence that takes into account the effect of magnetic shear. The magnetic curvature makes the model linearly unstable to interchange instability. As a first approximation, it is assumed that the island growth is not affected by the surrounding turbulence since the latter evolves on a much faster time scale. Thus, the model is electrostatic and the island can be treated as a fixed object. The equations are solved numerically in a slab box by using a finite difference, fully implicit code that uses PETSc libraries. The interchange turbulence with and without the magnetic island is compared. In particular, the response of the turbulence to different magnetic island widths and collisionality values is examined.

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