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Tearing mode transitions induced by electrostatic turbulence FULVIO MILITELLO, IFS, University of Texas and CMPD, FRANCOIS WAELBROECK, RICHARD FITZPATRICK, WENDELL HORTON, IFS, University of Texas — The effect of electrostatic turbulence on the stability and propagation of the magnetic islands is investigated numerically. The physical model used is a 2-D version of the Hasegawa-Wakatani equations, which is the simplest model of electrostatic turbulence that takes into account the effect of magnetic shear and finite resistivity. Our equations are extended to include a curvature term, that makes the model linearly unstable to interchange instability. The problem is solved numerically in a slab box by using a finite difference, fully implicit code that uses PETSc libraries. Turbulence is found to cause transitions between the different roots for the propagation velocity of the mode. The transitions take the mode towards roots with slower propagation that are characterized by locally flattened profiles. At constant velocity, the effect of the turbulence is to increase the drive for the tearing mode but this effect may be compensated by the generally stabilizing effect of reducing the propagation velocity.

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