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Momentum transport in magnetic islands F.L. WAELBROECK, Institute for Fusion Studies, U. Texas, D. GRASSO, F. PORCELLI, C. TEBALDI, Politecnico de Torino, Italy — We examine the transport of momentum across an island using the reduced magnetohydrodynamic (RMHD) model. We find that the Reynolds stress gives rise to a momentum source proportional to the resistivity. As a result of the frozen-in property the transport of momentum can be described by a one-dimensional equation, even for islands with finite aspect-ratio. We present numerical and analytic solutions of this transport equation and compare these solutions to numerical solutions of the full time-dependent RMHD equations. Of particular interest is the momentum transport in islands where the helical current density reverses sign. In such islands, the Reynolds stress also reverses sign, creating the possibility for localized zonal flow generation. The constant-psi approximation, however, fails in the presence of current reversal. We have developed new equilibrium solutions for thin islands that we plan to use to examine the transport of momentum in the presence of current reversal.

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