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On the rotation of magnetic islands in a tokamak X. GARBET, CEA Cadarache, France, A. SMOLYAKOV, University of Saskatchewan, Canada, E. LAZZARO, Istituto di Fisica del Plasma, Italy, M. OTTAVIANI, CEA Cadarache, France — We investigate various mechanisms affecting the rotation of magnetic islands. Generally, the rotation of a magnetic island is determined by a $\sin[m(\theta - \zeta/q) - \omega t]$ component of the non-ambipolar electric current. We consider several processes leading to the transverse non- ambipolar electric currents in a tokamak such as small-scale electromagnetic turbulence, anomalous viscosity, and neoclassical transport. It is argued that in a toroidal plasma the non-ambipolar neoclassical transport is a dominant process. It results in the locking of the magnetic island into the ion poloidal motion.

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