

Abstract Submitted
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Theoretical Issues on the Spontaneous Rotation of Axisymmetric Plasmas* T. ZHOU, B. COPPI, MIT — An extensive series of experiments have confirmed that the observed phenomenon of “spontaneous rotation” in axisymmetric plasmas is connected to the excitation of relevant collective modes [1] and, consequently, both to the confinement properties of the concerned plasmas, when referring to electrostatic modes, and to the magnetic reconnection processes associated with the excitation of electromagnetic modes [2]. Internal localized modes [2] can extract angular momentum from the plasma column from which they grow while, the background plasma has to recoil in the direction opposite to that of mode phase velocity. In the case of the excitation of plasma edge modes, the loss of their angular momentum can be connected to the directed particle ejection to the surrounding medium. The recoil angular momentum is then redistributed inside the plasma column mainly by a process that includes [1] the contribution of an effective viscous diffusion and of an inward (pinch) angular momentum flux that is connected, for instance, to ETG or ITG driven modes. *US DOE partly sponsored.

[1] B. Coppi, 18th IAEA Fusion Energy Conf. THP 1/17 (2000). and *Nucl. Fus.* **42**, 1 (2002).

[2] B. Coppi and T. Zhou, to be published in *Nucl. Fus.* (2014) and M.I.T.-L.N.S. Report 13/06 (2014).

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