

Abstract Submitted
for the APR06 Meeting of
The American Physical Society

Successes of the “Accretion Theory” for the Spontaneous Rotation Phenomenon and Relevant Theoretical Issues¹ J. THOMAS, B. COPPI, MIT

— A considerable series of experiments have shown evidence for the key elements of the “Accretion Theory” [1,2] of the Spontaneous Rotation Phenomenon in axisymmetric plasmas with rather diverse magnetic confinement configurations (tokamaks with and without divertors, RFP’s, etc.). These elements are: i.) angular momentum is “ejected” toward the material wall surrounding the plasma; ii.) angular momentum of the opposite sign is transported from the edge of the plasma column toward the center; iii.) rotation is strongly affected by the physical regime and the magnetic configuration of the outer region of the plasma column; iv.) rotation is inverted in the transition from the L-regime to a good ion confinement regime; v.) the phase velocities of the mode excited near the edge are inverted in this transition. In the good ion confinement regime the edge-modes that scatter angular momentum to the wall are expected to have phase velocities in the direction of the electron diamagnetic velocity while the modes transporting angular momentum toward the center from the edge have opposite phase velocities. Experimental observations have also confirmed this expectation. [1] B. Coppi, *Nucl. Fus.* **42**, 1 (2002). [2] B. Coppi, MIT-RLE Report PTP 02/05, Cambridge 2002

¹Sponsored in part by the U.S. D.O.E.

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Date submitted: 13 Jan 2006

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