

Abstract Submitted  
for the DPP05 Meeting of  
The American Physical Society

**Anomalous Inward Particle Transport and Alcator Internal Transport Barrier** B. COPPI, M.I.T. — The inward particle transport in the outer region of the plasma column has been attributed<sup>1</sup> to the combined effects of the collisional longitudinal electron thermal conductivity, the electron temperature gradient and the excitation of the ion temperature gradient driven mode. Since the density can penetrate toward the core of the plasma column, we consider that Inhomogeneous Electron Temperature Gradient Driven Modes that are localized near rotational magnetic surfaces by the effects of magnetic shear like the ITG mode presented in Ref.<sup>2</sup>, are shown to take over directly or indirectly the task of carrying particle inward if the ion temperature gradient is larger than the density gradient. An interpretation of the onset of the Internal Transport Barrier formed by off axis ICRH in a series of Alcator C-Mod experiments is interpreted as a displacement toward the outside of the inflexion point of the ion temperature profile where the degree of collisionality is higher and the particle inflow is more vigorous. Then, the density profile becomes more peaked in the center of the plasma column and the ITG modes that can carry angular momentum toward this region are suppressed<sup>3</sup>.  
\*Supported in part by the US DOE.

<sup>1</sup>B. Coppi and C. Spight, *Physical Review Letters* **41** (8), 551 (1978)

<sup>2</sup>B. Coppi, M. Rosenbluth, R. Sagdeev, *Phys. Fluids* **10**, 582 (1967)

<sup>3</sup>B. Coppi, *Nucl. Fusion* **42**, 1-4 (2002)

B. Coppi  
M.I.T.

Date submitted: 21 Jul 2005

Electronic form version 1.4