

Abstract Submitted  
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**Heavy Particle Modes and I-mode Plasmas**<sup>1</sup> M. VICTORA, B. COPPI, T. ZHOU, MIT — The excitation of a heavy particle mode [1,2] at the plasma edge is considered as the signature of the I-Regime [3]. The mode phase velocity, predicted in the electron diamagnetic velocity direction, was confirmed by the experiments [4]. The outward impurity transport produced by this mode is consistent with the observation that impurities accumulate at the edge in the I-Regime, a feature not present in the EDA or Elmy H-Regime. The plasma spontaneous rotation in the ion diamagnetic velocity direction is also consistent with the mode phase velocity direction, according to the Accretion Theory [5] of this phenomenon. In accordance with our theory, the I-Regime exhibits a temperature pedestal at the edge but no density pedestal as the mode excitation involves large values of  $d \ln T_i / d \ln n_i$ . A correlation of the values of the observed poloidal magnetic field fluctuations with those of the derived density fluctuations is provided by the same theory.

[1] B. Coppi et al., Phys. Rev. Lett. 17, 377 (1966).

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[5] B. Coppi, Nucl. Fusion 42, 1 (2002).

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