Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Study of the low-frequency ion-cyclotron turbulence in a cylindrical plasma magnetically confined STEVE JAEGER, ABDELILAH AJENDOUZ, CEDRIC BRAULT, Univ. de Provence, AMINE ERRADI, Univ. de Versailles, THIERY PIERRE, CNRS, ALEXANDRE ESCARGUEL, CYRIL REBONT, NICOLAS CLAIRE, Univ. de Provence, ERIC FAUDOT, STEPHANE HEURAUX, Univ. de Nancy, KAMAL QUOTB, CNRS, PIIM, LABORATOIRE DE PHYSIQUE DES INTERACTION IONIQUES ET MOLECULAIRES, CNRS-UNIV. DE PROVENCE - XPM TEAM, LPMIA, LABORATOIRE DE PHYSIQUE DES MILIEUX IONISES, CNRS-UNIV. H.POINCARE COLLABORATION — A cylindrical column of magnetized plasma is produced by means of the hot cathode laboratory device MISTRAL using various gases (Neon, Argon, Krypton). In usual experimental conditions, strongly nonlinear low frequency instabilities in the ion cyclotron range are recorded. A transition towards ion cyclotron turbulence appears to be triggered by a threshold value of the radial electric field. In order to investigate the characteristics of the instabilities and the phenomena responsible for the destabilization of the plasma column, detailed measurements are performed using various diagnostics (probe arrays, ultra-fast and intensified cameras, Laser Induced Fluorescence, spectroscopy, microwave resonance). The results are compared with both a theoretical model of the ion cyclotron instability and Particle in Cell simulation of the instability.

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Date submitted: 22 Jul 2007 Electronic form version 1.4