

Abstract Submitted  
for the DPP15 Meeting of  
The American Physical Society

**Recently Observed Features of the Quasi-Coherent Mode and Relevant Theory**<sup>1</sup> P. MONTAG, B. COPPI, L. SUGIYAMA, MIT — Recent experiments [1] have brought to light new features of the so-called Quasi Coherent Mode (QCM) observed when the EDA H-Confinement regime is produced by the Alcator C-Mod machine. This mode 1) has a phase velocity in the direction of the electron diamagnetic velocity in the reference frame where no equilibrium electric field is present; 2) involves relatively high electron temperature fluctuations; 3) is highly localized radially at the outer edge of the plasma column and extending beyond the Last Closed Magnetic Surface (LCMS). According to our theoretical model [2]. i) The relevant resistive mode driving factor is the sharp plasma pressure gradient developing at the edge when the plasma enters the EDA H-Regime. ii) A new kind of mode topology is identified. iii) The mode localization in the poloidal direction (ballooning) is related to the limited region around the equatorial plane where the pitch of the magnetic field is about constant [3]. The electron temperature fluctuations are consistent with the low thermal conductivity in the edge region.

[1] B. LaBombard, Bull. Am. Phys. Soc. 58, (2013) 367.

[2] B. Coppi, B. Basu, et. al., 2014 IAEA Int. Fus. En. Conf. TH-P7/10, submitted to Nucl. Fus.

[3] L. Sugiyama and H. R. Strauss, Phys. Plasmas 17, (2010) 06250.

<sup>1</sup>Sponsored in part by the U.S. DoE.

Bruno Coppi  
MIT

Date submitted: 14 Jul 2015

Electronic form version 1.4