Contribution ID: **285** Type: **Poster**

Phase Locking, Phase Slips and Turbulence: A New Approach to Mechanisms for Quiescent H-Mode

Tuesday, 18 October 2016 08:30 (4 hours)

We demonstrate E × B shear governs the dynamics of the cross phase of the peeling-ballooning-(PB)mode-driven heat flux, and so determines the evolution from the edge-localized (ELMy) H mode to the quiescent (Q) H mode. A physics-based scaling of the E × B shearing rate for accessing the QH mode is predicted. The ELMy H mode to the QH-mode evolution is shown to follow from the conversion from a phase locked state to a phase slip state. In the phase locked state, PB modes are pumped continuously, so bursts occur. In the slip state, the PB activity is a coherent oscillation. Strong E × B shearing implies a higher phase slip frequency. PB turbulence can degrade slip coherency. This model predicts a new state of cross phase dynamics and gives a new understanding of the mechanism for ELMy to QH-mode evolution.

This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Fusion Energy Sciences, under Award Numbers DE-FG02-04ER54738 and DE-SC0008378.

Paper Number

TH/P1-38

Country or International Organization

USA

Primary author: Dr GUO, ZHIBIN (University of California, San Diego)

Co-author: Prof. DIAMOND, Patrick (University of California San Diego)

Presenter: Dr GUO, ZHIBIN (University of California, San Diego)

Session Classification: Poster 1

Track Classification: THS - Magnetic Confinement Theory and Modelling: Stability