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The Shoelace Antenna: Measurements of Driven Transport and Prospects for Active Edge Control[1] THEODORE GOLFINOPOULOS, B. LABOMBARD, D. BRUNNER, J.L. TERRY, S.G. BAEK, P. ENNEVER, E. EDLUND, W. HAN, W.M. BURKE, S.M. WOLFE, J.H. IRBY, J.W. HUGHES, E.W. FITZGERALD, R.S. GRANETZ, M.J. GREENWALD, R. LECCACORVI, E.S. MARMAR, S.Z. PIERSON, M. PORKOLAB, R.F. VIEIRA, S.J. WUKITCH, AND THE ALCATOR C-MOD TEAM, Massachusetts Institute of Technology — The Shoelace antenna was built to drive edge fluctuations in the Alcator C-Mod tokamak, matching the wavenumber (k =1.5/cm) and frequency (50<f<200 kHz) of the Quasi-Coherent Mode (QCM). This fluctuation is responsible for regulating transport across the plasma boundary in the steady-state, ELM-free Enhanced Dα(EDA) H-mode; the goal of the Shoelace antenna is to regulate edge transport actively via the same mechanism. Initial experiments demonstrated that the antenna drove a resonant response in the edge plasma in steady-state EDA and transient, non-ELMy H-modes, but transport measurements were unavailable. In 2016, the Shoelace antenna was relocated to enable direct measurements of driven transport by a reciprocating Mirror Langmuir Probe, while also making available gas puff imaging and reflectometer data to provide radial localization of the driven fluctuation. This talk will describe these measurements, and compare them to those of the intrinsic QCM in the context of assessing the feasibility of achieving active control of edge transport using direct coupling to edge modes.

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