

Abstract Submitted
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Progress in modeling and experiment to approach AT regime on Alcator C-Mod¹ S. SHIRAIWA, P.T. BONOLI, I. FAUST, O. MENEGHINI, A. HUBBARD, R.R. PARKER, G.M. WALLACE, PSFC, MIT, J.R. WILSON, PPPL — Key issues in approaching an advanced tokamak (AT) regime where the majority of plasma current is sustained by bootstrap (BS) current on Alcator C-Mod are to improve confinement via current profile modification and to drive the rest of current at high density using LHCD. As for the first issue, fully non-inductive operation has been demonstrated at a current of ~ 0.5 MA and at a density close to what is expected on ITER steady state operations. MSE pitch angle measurement showed that these plasmas had a flat or weak reversed shear profile, and TRANSP modeling of the current profile evolution is in good agreement with experiment. Some of these discharges exhibited the formation of an ITB on the electron temperature profile. This barrier formation was always observed about 200-300ms (longer than a current penetration time) after the turn-on of LHCD, suggesting an improved confinement mode due to shear reversal. As for driving current at high density with a high BS fraction, modeling suggests that a key is to maintain good single pass power absorption.

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Syun'ichi Shiraiwa

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