

Impact of the Pedestal on Global Performance and Confinement Scalings in I-Mode

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Abstract. I-mode is a novel alternate high-confinement tokamak regime, notable for the formation of a strong temperature pedestal with associated H-mode-like increase in energy confinement, without the accompanying density pedestal or suppression of particle transport. I-mode exhibits a number of attractive features for a tokamak reactor regime, namely (1) an inherent lack of large, deleterious Edge-Localized Modes (ELMs), (2) minimal impurity accumulation and radiative loss compared to conventional H-modes, and (3) an apparent lack of strong degradation of energy confinement with input heating power. Previous analyses of I-mode experiments at Alcator C-Mod have elucidated the pedestal structure in I-mode, particularly in its strong positive response to fueling and input heating power.

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1. Introduction

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References

- [1] J. R. Walk, J. W. Hughes, A. E. Hubbard, J. L. Terry, D. G. Whyte, A. E. White, S. G. Baek, M. L. Reinke, C. Theiler, R. M. Churchill, J. E. Rice, P. B. Snyder, T. Osborne, A. Dominguez, and I. Cziegler. Edge-localized mode avoidance and pedestal structure in I-mode plasmas. *Physics of Plasmas*, 21(5):056103, 2014.