

Abstract Submitted
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Control of the Current Profile Evolution During the Ramp-Up Phase at DIII-D¹ Y. OU, E. SCHUSTER, Lehigh U., J.R. FERRON, T.C. LUCE, M.L. WALKER, D.A. HUMPHREYS, General Atomics, T.A. CASPER, W.H. MEYER, LLNL — Setting up a suitable current profile has been demonstrated to be a key condition for advanced scenarios with improved confinement and possible steady-state operation. Experiments at DIII-D focus on creating the desired q profile during the plasma current ramp-up and early flattop phases with the aim of maintaining this profile during the subsequent phases of the discharge. Active feedback control of the q profile evolution at DIII-D has already been demonstrated [1], and an open-loop control scheme has been proposed [2] based on a simplified control-oriented dynamic model [3]. The use of Corsica for both control testing and design is reported, and results of open-loop current profile control experiments are presented.

[1] J.R. Ferron, et al., Nucl. Fusion **46** (2006) L13.

[2] Y. Ou, et al., *Proc. Am. Control Conf.*, New York (2007).

[3] Y. Ou, et al., Fusion Eng. & Design **82** (2007) 1153.

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