

Abstract Submitted
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Conceptual design of real-time density control via FIRETIP in NSTX¹ J-W. JUHN, Seoul University, K.C. LEE, C.W. DOMIER, N.C. LUHMANN, JR., UC Davis, Y.S. HWANG, Seoul University, D. MUELLER, D.A. GATES, B.P. LEBLANC, R. KAITA, PPPL — Real-time density feedback control is desirable in tokamaks to avoid low-density discharges and for scaling experiments. The NSTX density feedback control system has been designed in conjunction with the Far Infrared Tangential Interferometer/Polarimeter (FIRETIP). FIRETIP signals are sampled at 5 kHz, using a plasma control system (PCS) for real-time correction of fringe jump errors. Raw data obtained from 2010 experiments have been analyzed with a new PCS algorithm comprised of status indicator, density convertor, fringe jump corrector and feedback controller. Converted density signals from measured data are compared to reference data and converted to gas flow rates through existing PCS gas-injector-system categories. The hardware and software configuration of the feedback control system and experimental test results will be presented with a discussion of control algorithms for density evolution.

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