

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

First Trial of Real-time Poloidal Beta Control in KSTAR¹ HYUN-SUN HAN, S.H. HAHN, J.G. BAK, National Fusion Research Institute, M.L. WALKER, General Atomics, M.H. WOO, J.S. KIM, Y.J. KIM, Y.S. BAE, National Fusion Research Institute, KSTAR TEAM — Sustaining the plasma in a stable and a high performance condition is one of the important control issues for future steady state tokamaks. In the 2014 KSTAR campaign, we have developed a real-time poloidal beta (β_p) control technique and carried out preliminary experiments to identify its feasibility. In the control system, the β_p is calculated in real time using the measured diamagnetic loop signal (DLM03) with coil pickup corrections, and compared with the target value leading to the change of the neutral beam (NB) heating power using a feedback PID control algorithm. To match the required power of NB which is operated with constant voltage, the duty cycles of the modulation were adjusted as the ratio of the required power to the maximum achievable one. This paper will present the overall procedures of the β_p control, the β_p estimation process implemented in the plasma control system, and the analysis on the preliminary experimental results.

¹This work is supported by the KSTAR research project funded by the Ministry of Science, ICT & Future Planning of Korea.

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Date submitted: 09 Jul 2014

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