

Abstract Submitted  
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**Rotational Control of Plasma in NSTX**<sup>1</sup> KUNIHICO TAIRA, EGEMEN KOLEMEN, Princeton University, DAVID GATES, Princeton Plasma Physics Laboratory, CLARENCE ROWLEY, JEREMY KASDIN, Princeton University — In an effort to assist the continuous extraction of fusion energy, a plasma model and a controller are developed for a magnetic fusion device (NSTX). The model is aimed to capture the rotational (toroidal) momentum transport inside the tokamak. The neutral beam injection and the neoclassical toroidal viscosity are considered in the model for their uses as actuator forces. Based on the proposed model, a feedback controller is designed to sustain the toroidal momentum of the plasma in a stable fashion and to achieve desirable plasma geometry. The model reduction and design approaches will be presented along with validation studies.

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Kunihiko Taira  
Princeton University

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