Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

GPU-Based Optimal Control Techniques for Resistive Wall Mode Control on DIII-D[1] M. CLEMENT, University of California San Diego, G.A. NAVRATIL, J.M. HANSON, Columbia University, E.J. STRAIT, General Atomics — The DIII-D tokamak can excite strong, locked or nearly locked kink modes whose rotation frequencies do not evolve quickly and are slow compared to their growth rates. To control such modes, DIII-D plans to implement a Graphical Processing Unit (GPU) based feedback control system in a low-latency architecture based on system developed on the HBT-EP tokamak [1]. Up to 128 local magnetic sensors will be used to extrapolate the state of the rotating kink mode, which will be used by the feedback algorithm to calculate the required currents for the internal and/or external control coils. Offline techniques for resolving the mode structure of the resistive wall mode (RWM) will be presented and compared along with the proposed GPU implementation scheme and potential real-time estimation algorithms for RWM feedback.

[1] N. Rath, Plasma Phys. Control. Fusion **55**, 084003 (2013).

[1]Work supported by the US Department of Energy under DE-FG02-07ER54917, DE-FG02-04ER54761, and DE-FC02-04ER54698.

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Date submitted: 11 Jul 2014 Electronic form version 1.4