Abstract Submitted
for the DPP99 Meeting of
The American Physical Society

Sorting Category: 5.1.1.2 (Experimental)

Time-dependent Modeling of Sustained Advanced Tokamak Scenarios[1] T.A. CASPER, L.L. LODESTRO, L.D. PEARLSTEIN, Lawrence Livermore National Laboratory, M. MURAKAMI, Oak Ridge National Laboratory, L.L. LAO, H.E. ST. JOHN, General Atomics — We are modeling time-dependent behavior of AT operating modes sustained by electron cyclotron heating and current drive for a variety of plasma conditions and heating locations. Using experimentally achieved DIII–D discharge conditions with theory-based and experimentally fitted transport models, we investigate techniques to control the hollow current profiles required for steady-state operation. We include effects of strong heating and variations in ion and electron temperatures and density profiles. We find that, at moderate levels of microwave power, we can sustain transport barriers for long intervals with evolution to non-inductively current-driven conditions under many scenarios. For the high temperatures in DIII–D discharges, the equilibration time is long, taking several seconds to reach the non-inductively driven state. We will present details of these time-dependent simulations including effects of temporal variations of neutral beam and electron cyclotron heating.

[1]Supported by U.S. DOE Contracts W-7405-ENG-48, DE-AC05-96OR22464, and DE-AC03-99ER54463.

T.A. Casper
tac@nonna.llnl.gov
Lawrence Livermore National Laboratory

☐ Prefer Oral Session
☒ Prefer Poster Session

Special instructions: DIII-D Poster Session 2, immediately following JS deGrassie

Date printed: July 16, 1999 Electronic form version 1.4