Abstract Submitted
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Physics-Based Performance Projections for Fusion Development Facility[1] V.S. CHAN, R.D. STAMBAUGH, M.S. CHU, R.K. FISHER, C.M. GREENFIELD, D.A. HUMPHREYS, L.L. LAO, J.A. LEUER, T.W. PETRIE, R. PRATER, G.M. STAEBLER, H.E. ST JOHN, P.B. SNYDER, A.D. TURNBULL, M.A. VAN ZEELAND, General Atomics — The Fusion Development Facility (FDF) is a fusion application development facility based on advanced tokamak physics with copper magnets and tritium breeding capability. Theory based stability and transport studies are used to validate the performance projections from a system study based on simplified models. Ideal global and edge stability limits established by further optimization of high performance equilibria obtained in existing experiments indicate that the FDF power density and neutron flux requirements can be met with strong shaping and feedback control. Transport analysis using physics-based transport model with an edge condition consistent with the pedestal stability limit indicate the FDF confinement requirement can also be achieved. Interesting opportunities for study of alpha physics and challenges on first walls will be discussed.

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L.L. Lao
General Atomics

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