

Abstract Submitted
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Sorting Category: 5.1.1.5 (Experimental)

ITER Plasma Start-up Simulation,¹ J. LEUER, General
Atomics, A. PORTONE, ITER Co-Center, Naka, Japan — Character-
istics of ITER plasma startup are presented. The initial magnetization,
breakdown and initial plasma current ramp-up phases of ITER opera-
tion are optimized based on coil voltage and current limitations. Induced
axisymmetric eddy currents in the first wall-blanket, vacuum vessel and
cryostat are included in the analysis using an eigen-mode technique. A
constrained, least squares optimization technique is used to minimize
an object functional containing prescribed fields, field time derivatives
and voltages needed for plasma breakdown and stable current ramp-
up. Within the prescribed coil voltage and current limitations, plasma
current ramp rates of 0.5 MA/s are achievable. Approximately 5% of
the total flux swing capability is lost prior to achieving breakdown as a
consequence of eddy currents driven in the structure prior to build up
of adequate voltage in the breakdown region. Resistivity of the passive
structure is shown to strongly influence the overall system performance.
Startup scenarios which enhance the breakdown performance are dis-
cussed.

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Prefer Oral Session
 Prefer Poster Session

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