

Abstract Submitted  
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**Edge-relevant plasma simulations with the continuum code COGENT**<sup>1</sup> M. DORF, M. DORR, D. GHOSH, J. HITTINGER, T. ROGNLIEN, LLNL, Livermore, CA94550, R. COHEN, CompX, Del Mar, CA 92014, W. LEE, UCSD, La Jolla, CA 92093 , P. SCHWARTZ, LBNL, Berkeley, CA 94720 — We describe recent advances in cross-separatrix and other edge-relevant plasma simulations with COGENT, a continuum gyro-kinetic code being developed by the Edge Simulation Laboratory (ESL) collaboration. The distinguishing feature of the COGENT code is its high-order finite-volume discretization methods, which employ arbitrary mapped multiblock grid technology (nearly field-aligned on blocks) to handle the complexity of tokamak divertor geometry with high accuracy. This paper discusses the 4D (axisymmetric) electrostatic version of the code, and the presented topics include: (a) initial simulations with kinetic electrons and development of reduced fluid models; (b) development and application of implicit-explicit (IMEX) time integration schemes; and (c) conservative modeling of drift-waves and the universal instability.

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Mikhail Dorf  
LLNL, Livermore, CA94550

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