Abstract Submitted
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**Generalized resistive wall boundary conditions for cylindrical and toroidal geometry in Nimrod**[1] A.L. MONTGOMERY, C.C. HEGNA, C.R. SOVINEC, University of Wisconsin, Madison, S.E. KRUGER, Tech-X Corp., S.A. SABBAGH, Columbia University — A generalized resistive wall boundary condition is implemented in Nimrod, making it possible to study both cylindrical and toroidal geometries with arbitrary toroidal shaping. The magnetic fields inside the computational domain are matched at the wall with external fields found using a vacuum-field solver. Results using the generalized boundary condition for a periodic cylinder with an analytically simple equilibrium are compared with theory and previous numerical work. The new boundary condition is tested for toroidal geometry in the large aspect ratio, circular cross-section limit. With a toroidal resistive wall condition, Nimrod can be used with a reconstructed National Spherical Torus Experiment (NSTX) equilibrium to study passive resistive wall mode stabilization with rotation [1,2]. Methods for including external resonant magnetic perturbations in the generalized boundary condition will also be discussed.

[1] S.A. Sabbagh et al., Nucl. Fusion, **46** 635 (2006).
[2] S.A. Sabbagh et al., Nucl. Fusion, **50** 025020 (2010)

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Andrea Montgomery
University of Wisconsin, Madison

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