Abstract Submitted
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Extending SIESTA capabilities: removing field-periodic and stellarator symmetric limitations[1] C.R. COOK, University of Wisconsin-Madison, S.P. HIRSHMAN, Oak Ridge National Laboratory, R. SANCHEZ, Universidad Carlos III de Madrid, D.T. ANDERSON, University of Wisconsin-Madison — SIESTA is a three-dimensional magnetohydrodynamics equilibrium code capable of resolving magnetic islands in toroidal plasma confinement devices. Currently SIESTA assumes that plasma perturbations, and thus also magnetic islands, are field-periodic. This limitation is being removed from the code by allowing the displacement toroidal mode number to not be restricted to multiples of the number of field periods. Extending SIESTA in this manner will allow larger, lower-order resonant islands to form in devices such as CTH. An example of a non-field-periodic perturbation in CTH will be demonstrated. Currently the code also operates in a stellarator-symmetric fashion in which an "up-down" symmetry is present at some toroidal angle. Nearly all of the current tokamaks (and ITER in the future) operate with a divertor and as such do not possess stellarator symmetry. Removal of this symmetry restriction requires including both sine and cosine terms in the Fourier expansion for the geometry of the device and the fields contained within. The current status of this extension of the code will be discussed, along with the method of implementation.

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