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Comparisons of transport in quasi-axisymmetric stellarators H.E. MYNICK, PPPL, A.H. BOOZER, Columbia University, L.P. KU, PPPL, E.A. LAZARUS, General Atomics — We compare the confinement characteristics of some related QA stellarator designs, including LI383, the basis for the NCSX stellarator now being constructed. LI383 has very good thermal neoclassical confinement, while its energetic particle confinement is more problematic for a reactor. We find that both thermal and energetic confinement in LI383 can be appreciably improved,[1] by small perturbations which largely eliminate a class of bad drift trajectories not previously recognized. The coil set planned for NCSX should be able to reduce this class of bad trajectories. As part of this assessment, we also consider perturbations which violate stellarator symmetry, including up/down symmetry of the device.[2] We find that such perturbations neither improve nor degrade confinement, in general, but their effects depend on details. Work supported by U.S.DOE Contract No.DE-AC02-76-CHO3073.

[1]H.E. Mynick, A.H. Boozer, L.-P. Ku, *Phys. Plasmas* (2006).
[2]P.N. Yushmanov, J.R. Cary, S.G. Shasharina, *Nucl.Fusion* **33**, 1293 (1993).

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