

Abstract Submitted
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An overview of ideal MHD stability calculations for the Quasi-Poloidal Stellarator¹ A.S. WARE, L. HERRMANN, E. MONDLOCH, University of Montana, J.F. LYON, R. SANCHEZ, D.A. SPONG, Oak Ridge National Laboratory — An overview of the status of ideal MHD stability calculations for the Quasi-Poloidal Stellarator (QPS) is presented. The primary focus of these calculations has been infinite- n ballooning modes using the COBRAVMEC code. Previously, it was shown that QPS is potentially susceptible to ballooning instabilities for $\langle\beta\rangle > 2\%$ and that regions of second stability exist for $\langle\beta\rangle > 4\%$ [A. S. Ware, *et al.*, Phys. Plasmas **11**, (2453)]. Recent calculations have examined the possibility of testing ballooning stability in QPS at lower plasma beta. An optimization is underway that targets degraded ballooning stability at $\langle\beta\rangle \sim 1\%$ without degrading the neoclassical confinement properties. The results of this optimization will be presented. In addition to the infinite- n calculations, previous work has been done on global, finite- n calculations using the TERPSICHORE code. Here, we present a status report on initial attempts to apply both the TERPSICHORE and CAS3D codes to examine global ideal MHD stability for QPS plasmas.

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