

Abstract Submitted  
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**Initial coil sets for a high- $\beta$  stellarator-tokamak hybrid**<sup>1</sup> B. SCHLOMANN, A.S. WARE, University of Montana, D.A. SPONG, Oak Ridge National Laboratory — Magnetic coil configurations have been developed for a drift-optimized, tokamak-stellarator hybrid that is stable to both pressure- and current-driven modes for high values of  $\beta$ . Previous work on this configuration [A. S. Ware, *et al.*, Phys. Rev. Lett, 89, 125003 (2002)] was carried out using a fixed-boundary equilibrium (i.e., with no set of external coils). Here, we present initial work to produce a realizable coil set for such a configuration. This work is done using the COILOPT code to develop an initial coil set and the STELLOPT code to enhance the quality of the resulting free-boundary equilibria. Since this is a hybrid device, the initial modular coil sets have the advantage of being simpler than modular coils from recent stellarator design efforts (such as QPS and NCSX). Ballooning stability is analyzed using the COBRAVMEC code and transport properties are analyzed using the DKES code.

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