

Abstract Submitted  
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**A multi-institutional Stellarator Configuration Study**<sup>1</sup> DAVID GATES, Princeton Plasma Physics Laboratory — A multi-institutional study aimed at mapping the space of quasi-axisymmetric stellarators has begun. The goal is to gain improved understanding of the dependence of important physics and engineering parameters (e.g. bootstrap current, stability, coil complexity, etc.) on plasma shape (average elongation, aspect ratio, number of periods). In addition, the stellarator optimization code STELLOPT will be upgraded with new capabilities such as improved coil design algorithms such as COILOPT++ and REGCOIL, divertor optimization options, equilibria with islands using the SPEC code, and improved bootstrap current calculations with the SFINCS code. An effort is underway to develop metrics for divertor optimization. STELLOPT has also had numerous improvements to numerical algorithms and parallelization capabilities. Simultaneously, we also are pursuing the optimization of turbulent transport according to the method of proxy functions. Progress made to date includes an elongation scan on quasi-axisymmetric equilibria and an initial comparison between the SFINCS code and the BOOTSJ calculation of bootstrap current currently available in STELLOPT. Further progress on shape scans and subsequent physics analysis will be reported. The status of the STELLOPT upgrades will be described. The eventual goal of this exercise is to identify attractive configurations for future US experimental facilities..

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