

Abstract Submitted  
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**Energetic Particle Confinement in Optimized Stellarators**<sup>1</sup> ANNA VONESSEN, ANDREW WARE, University of Montana — Testing and analysis of the confinement of fusion alpha particles and energetic ions in optimized stellarator configurations is presented. The SIMPLE code has been developed to speed up the calculation of fusion alpha particle losses in stellarator configurations [A. C. Albert, S. Kasilov, and W. Kernbichler, *J. Plasma Physics* **86**, 815860201 (2020)]. The primary focus of this work will be using the SIMPLE code to analyze alpha confinement in quasi-helically symmetric stellarator configurations. First, the results of the SIMPLE code will be tested against an alpha confinement code developed by Nemov, et al. [V.V. Nemov, *et al.*, *Phys. Plasmas* **21**, 062501 (2014)]. Alpha confinement will be calculated for an optimized five-field period reactor configuration as a function of flux surface. This will be coupled with estimates of alpha production to calculate the total alpha confinement. Finally, the confinement of energetic ions in a midscale stellarator experiment is analyzed. This will include analysis of the impact of optimizing with both a modular coil set and a poloidal field coil set.

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