

Abstract Submitted
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US Collaboration on the W7-X stellarator G.A. WURDEN, LANL, D.A. GATES, PPPL, J.H. HARRIS, ORNL, G.H. NEILSON, PPPL, A. LUMSDAINE, ORNL, A. SIMAKOV, LANL, M. ZARNSTORFF, PPPL — The new US-German collaboration on the W7-X stellarator in Greifswald, is in its first year as an ICC project. Los Alamos, Princeton, and Oak Ridge have organized an effort centered on applications of 3D magnetic fields to improve the performance and design of toroidal confinement devices, and to develop the means to control heat flux in a steady state, high beta, 3D, diverted plasmas with reactor relevant parameters. Presently we have three focus areas: providing copper error correction coils to be mounted externally on the W7-X cryostat, developing a scraper element for the divertor, and working control issues under the theme of 3D Diverted Plasmas. The error correction coils must be designed and built on a fast schedule, to meet assembly timelines. ORNL has recently contributed to the design of the support fixtures for the room temperature to cryogenic coil connections. The LANL effort involves theoretical modeling of whether the stellarator bootstrap current depends on the radial electric field, and an experimental investigation (IR imaging) of the heat loading and wall interactions in the W7-X divertor. W7-X is a modular niobium-titanium superconducting stellarator of the helias type, with 5-fold symmetry. It is presently 4/5 assembled, and first plasma is scheduled for August 2014. Other opportunities for increased collaboration scope abound.

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