

Abstract Submitted
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Design of a new high heat flux divertor component for the W7-X stellarator J.D. LORE, ORNL, T. ANDREEVA, IPP-Greifswald, J. BOSCARY, IPP-Garching, J. GEIGER, IPP-Greifswald, J.H. HARRIS, A. LUMSDAINE, D. MCGINNIS, ORNL, A. PEACOCK, IPP-Garching, J. TIPTON, U. Evansville — A new divertor component, known as the “scraper element,” is being designed for the high heat flux operational phase of W7-X. The scraper element (SE) protects regions of the main divertor from unacceptable heat loads that occur during the bootstrap current evolution in certain configurations. The excessive loads occur at intermediate values of the bootstrap current, as the configuration transitions from a limited divertor to an island divertor over ~ 40 s. The SE intercepts the field lines that would strike the overloaded components. Each row of the SE will be built using actively-cooled carbon fiber composite monoblocks of a similar type as those qualified for ITER, with heat fluxes on the order of $12\text{-}15\text{MW/m}^2$ in steady state. The heat flux magnitudes and the strike point patterns are calculated from following field lines in a 3D magnetic field that includes contributions from the vacuum equilibrium and the plasma currents. The latest SE design and supporting modeling will be presented. Work supported by D.O.E. contract DE-AC05-00OR22725.

John Canik
ORNL

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