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Controlling magnetic footprints wetted area using resonant magnetic perturbations STEFANO MUNARETTO, General Atomics, IGOR BYKOV, University of California San Diego, TODD E. EVANS, BRENDAN C. LYONS, General Atomics, DMITRI M. ORLOV, University of California San Diego, CARLOS PAZ-SOLDAN, General Atomics — The radial extension of the heat load distribution at the divertor plates due to 3D magnetic fields of a tokamak is determined by the resonant component of the non-axisymmetric field perturbations. Whether they are intrinsic, like error fields, or they are applied through 3D coils, the non-axisymmetric fields produce complex 3D edge magnetic topologies that alter the properties of the heat and particle flux distributions on the target plates. A study of the impact of applied 3D fields on the footprints wetted area is done for the DIII-D tokamak for several equilibria using the MHD code M3D-C1 coupled with the field line tracing code TRIP3D. To highlight the impact of the resonant component of the magnetic perturbation (MP) versus the non-resonant one, the poloidal spectrum of the MP is modified by varying the relative phase of the 2 rows of 3D coils used to produce n¡3 perturbation. This shows that the largest footprint is achieved when the relative phase of the 2 rows is close to zero, that corresponds to the maximum resonant coupling with the plasma. A comparison of the predictions with experimental data from particle flux and infrared images is also shown. Work supported by US DOE under DE-FC02-04ER54698, DE-FG02-07ER54917 and DE-FG02-05ER54809.

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