

Abstract Submitted  
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**The effect of ICRF and LHCD waveguide and launcher location on tritium breeding ratio and radiation damage**<sup>1</sup> J.M. SIERCHIO, D.G. WHYTE, G.M. WALLACE, S.J. WUKITCH, MIT PSFC — In most tokamak fusion reactor designs, ion cyclotron radio frequency (ICRF) and lower hybrid (LH) waves used to heat the plasma and drive current are launched from the low magnetic field side where there is more access space. It has been recently proposed to launch these waves from the high-field side [Podpaly et al. FED 87, 215 (2012), LaBombard et al. Nuc. Fus. 55, 053020 (2015), and Sorbom et al. FED (2015)], which increases efficiency, allows for better wave penetration, and has favorable scrape-off-layer characteristics [Wallace RFPPC (2015)]. We investigate whether there are added benefits to high-field side launch compared with low-field side launch, including a smaller reduction in the tritium breeding ratio (TBR) and less radiation damage as measured by displacements per atom (DPA) and He retention. We present results obtained with MCNP for TBR, DPA, and He retention for several geometries including two liquid immersion blanket designs and two solid blanket designs, while varying the location of a generic waveguide and antenna.

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