Abstract Submitted
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Investigation of lower hybrid wave polarization in WEST[1] G.M. WALLACE, S.G. BAEK, J.C. WRIGHT, MIT PSFC, N. BERTELLI, M. ONO, S. SHIRAIWA, PPPL, A. EKEDAHL, M. GONICHE, J. HILLAIRET, Y. PEYSSON, CEA IRFM, C.C. KLEPPER, C. LAU, E.H. MARTIN, ORNL — Theoretical studies identified the potential for $k_\perp$ rotation to impact lower hybrid (LH) wave propagation and absorption, and recent experimental analysis showed consistency between experimental LH current drive observations and modeling including $k_\perp$ rotation for Alcator C-Mod. Investigations on C-Mod indicate that rotation of $k_\perp$ may be due to scattering of the LH waves from density fluctuations. Conventional ray-tracing of LH waves assumes $k_\perp$ to be normal to the flux surface at the starting point of the ray. The DSELF diagnostic on WEST measures the LH wave electric field components (E_R, E_Z, E_ϕ) near the antenna via dynamic Stark effect spectroscopy, which then constrains the angle of $k_\perp$ rotation used at the launch point of rays in the model ($\sim \arctan(E_Z/E_R)$). This rotation of $k_\perp$ impacts the up/down-shifts of $k_{||}$ as well as the ray trajectory itself, leading to broader or more peaked absorption depending on the direction of rotation. Ray-tracing/Fokker-Planck simulations including $k_\perp$ rotation for WEST are presented in this work and compared with experimental data.

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