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Validating the simulation of the effects of secondary neutrals on the MSE gas-filled-torus calibration[1] WILLIAM SCHUMAKER, Lawrence Technological University, HOWARD YUH, FRED LEVINTON, Nova Photonics, Inc., STEVE SCOTT, Princeton Plasma Physics Laboratory — A common procedure of injecting a neutral beam into a gas-filled torus with known magnetic fields in vacuum is used to calibrate motional Stark effect (MSE) diagnostics on many toroidal magnetic devices. A cause of anomalies encountered in this calibration has been explained as a consequence of secondary neutrals from the ionized beam. Under certain conditions, these re-neutrals emit H-alpha spectra that have the proper Doppler shift to pass through the MSE filters yet have a different polarization than those from the primary beam neutrals, thus contaminating the measured Stark electric field angle. Existing IDL code has been adapted to simulate the gas-filled-torus calibration of MSE in Alcator C-Mod, NSTX, and TFTR vessel geometries. A sensitivity study involving the post-processing of outputs with different gas pressures, beam injection angles, magnetic field pitch angles, and system resolutions will benchmark the code against the respective experimental data.

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William Schumaker
ws000208734@ltu.edu
Lawrence Technological University

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