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NUBEAM developments and 3d halo modeling[1] M.V. GORELENKOVA, S.S. MEDLEY, S.M. KAYE, PPPL — Recent developments related to the 3D halo model in NUBEAM code are described. To have a reliable halo neutral source for diagnostic simulation, the TRANSP/NUBEAM code has been enhanced with full implementation of ADAS atomic physic ground state and excited state data for hydrogenic beams and mixed species plasma targets. The ADAS codes and database provide the density and temperature dependence of the atomic data, and the collective nature of the state excitation process. To be able to populate 3D halo output with sufficient statistical resolution, the capability to control the statistics of fast ion CX modeling and for thermal halo launch has been added to NUBEAM. The 3D halo neutral model is based on modification and extension of the "beam in box" aligned 3d Cartesian grid that includes the neutral beam itself, 3D fast neutral densities due to CX of partially slowed down fast ions in the beam halo region, 3D thermal neutral densities due to CX deposition and fast neutral recapture source. More details on the 3D halo simulation design will be presented.

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Robert Andre
PPPL

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