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Theory Experiment

Beam-Ion Confinement for Different Injection Angles,* W.W. Heidbrink, *UC Irvine*, C.C. Petty, M.A. Van Zeeland, *GA*, M. Murakami, J.M. Park, *ORNL*, J.H. Yu, *UCSD – DIII-D* is equipped with neutral beam sources that inject in four different directions; in addition, the plasma can be shifted up or down to compare off-axis with on-axis injection. Fast-ion data for eight different conditions have been obtained: co/counter, near-tangential/near-perpendicular, on-axis/off-axis. Neutron measurements during short beam pulses assess prompt and delayed losses under low-power conditions. As expected, co-injection has fewer prompt losses than counter, tangential than perpendicular, and on-axis than off-axis; the differences are greater at low current than at higher current. Fast-ion D_α (FIDA) measurements diagnose the confinement at higher power. The inferred fast-ion density is higher during co-injection than during counter-injection, although the spatial profile is similar. Comparisons of two-dimensional FIDA images with simulations based upon classical fast-ion behavior show excellent agreement in the on-axis case. The inferred fast-ion diffusion during off-axis injection will be presented.

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