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Transport study of the C-2 FRC plasma MARCO ONOFRI, SEAN DETTRICK, DANIEL BARNES, TOSHIKI TAJIMA, SANGEETA GUPTA, ERIK TRASK, LOTHAR SCHMITZ, Tri Alpha Energy, TAE TEAM — The 2D transport code Q2D is used to study transport in the C-2 Field Reversed Configuration with neutral beam injection. The code solves the MHD equations including source terms due to neutral beams, which are calculated by a Monte Carlo technique. We compare numerical simulations with experimental results obtained in C-2, where 6 neutral beams are injected into the plasma with energy of 20 keV and total power of 4.2 MW. Q2D simulations of C-2 start from an initial equilibrium and different values of the transport coefficients are used to study their effect on the evolution of the FRC. We investigate different transport coefficients, including those based on the TAE transport scaling. For the recent HPF14 confinement regime in C-2 we study the coupling between the scrape-off layer (SOL) and the FRC core by changing the mirror-plug constriction. We also observe that the number of fast ions is affected by the density of neutrals, which cause charge exchange, and by beam shinethrough, which also depends on SOL transport. These results are also compared with the 1D version of our transport code Q1D.

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