

Abstract Submitted  
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**Characterization of magnetohydrodynamic transport in a Field Reversed Configuration** MARCO ONOFRI, PETER YUSHMANOV, SEAN DETTRICK, DANIEL BARNES, KEVIN HUBBARD, TOSHI TAJIMA, Tri Alpha Energy, TAE TEAM — Transport in a Field Reversed Configuration (FRC) is studied by using the two-dimensional code Q2D, which couples a magnetohydrodynamic code with a Monte Carlo code for the beam component. The simulation by Q2D of the parallel transport in the simple open  $\theta$ -pinch fields and its associated outflow shows an excellent agreement with one of the existing theories, providing a benchmark for Q2D and simultaneously deepening the theoretical understanding of this fundamental process. We find a sharp distinction between the evolved radial density profiles of the FRC and mirror plasmas as a result of the transport processes, showing that the closed flux surfaces of an FRC enhance the confinement over that of a mirror. We characterize the scrape-off layer (SOL) transport by including the mirror trapping effects and we find a relation between the confinement time in the SOL and the ion collisional time. The Q2D code is also used to study the formation of the electrostatic potential in the divertor.

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