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Modeling of turbulent transport and flow generation in the HELCAT experiemnt A.S. WARE, M. OLSEN, M. BREYFOGLE, University of Montana, M. GILMORE, University of New Mexico, E. SCHUSTER, Lehigh University — This work investigates modeling of transport and flow generation in a linear plasma device using a 1-D transport code. The goal is to model the HELCAT experiment including the use of biased concentric rings as control elements for the radial electric field profile. By varying the bias voltages, the local $\mathbf{E}\times\mathbf{B}$ flow can be modified. The effect will be identical to a source of $\mathbf{E}\times\mathbf{B}$ flow in the limit of zero β (i.e., when diamagnetic flows are negligible). By varying the momentum sources a sheared radial electric field can be generated that can suppress turbulent particle and heat transport. Analysis of drift wave turbulence models will be used to derive models for the growth rate and Reynolds stress parameterization in the transport model. We will test the impact of different numerical models for the momentum sources and compare the results with experimental measurements of the radial electric field in the HELCAT experiment.

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