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Hysteresis effects in edge poloidal flow generation B. FETSCHER, N.D. DANIELS, A.S. WARE, University of Montana, D.E. NEWMAN, University of Alaska - Fairbanks, B.A. CARRERAS, Oak Ridge National Laboratory, C. HIDALGO, CIEMAT — Gas puffing at the edge of the TJ-II stellarator has been used to control the development of an edge poloidal velocity shear layer [1]. Recent experiments have been done to test for hysteresis in the development of the flow. In this work, a numerical transport model is used to examine for hysteresis in the development of an edge poloidal velocity shear layer due to a modeled gas puff. The transport model couples together density, ion temperature, electron temperature, poloidal flow, toroidal flow, radial electric field, and a fluctuation envelope equation which includes a shear-suppression factor. The physics of the model has been modified to include a turbulence growth rate for resistive ballooning modes as well as ion temperature gradient modes. The numerical integration in the model has been changed to a modified Runge-Kutta with adaptive time-stepping. For the cases run with parameters consistent with these TJ-II experiments (only RF heating, no neutral beams), the resistive ballooning mode growth rate is dominant in the edge region. In this work, we present results from a series of cases using parameters that are typical of TJ-II discharges and ramps (both up and down) of an edge density source term used to model a gas puff. The impact of the ramp on the generation of edge poloidal velocity is discussed.
[1] C. Hidalgo, et al., Phys. Rev. E 70, 067402 (2004).

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