Abstract Submitted
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On the generation of poloidal flow as result of an increased edge particle source[1] P. BOLENBAUGH, 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 — A transport model is used to study the impact of ramping an edge particle source on the generation of poloidal flow. The motivation for this work is gas puffing experiments conducted on the TJ-II stellarator [C. Hidalgo, *et al.*, Phys. Rev. E **70**, 067402 (2004)] that demonstrated the development of an edge poloidal velocity shear layer. 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 and electron temperatures, poloidal flow, toroidal flow, radial electric field, and a fluctuation envelope equation which includes a shear-suppression factor and now implements a modified Runge-Kutta with adaptive time-stepping. With the inclusion of diamagnetic flows, both critical and subcritical flows are possible. For subcritical flows (i.e., flows that do not trigger transition to a higher confinement regime), there is no true hysteresis in the flow. An apparent lag may be observed if the rate of ramping the particle source is rapid relative to transport time scales. For critical flows, a local transition model that does not include diamagnetic effects also shows the lack of a true hysteresis.

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