Abstract Submitted
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Transport of Runaway Electrons in MST Tokamak Discharges with RMPs (PhD Oral-24)[1] BRIAN CORNILLE, CARL SOVINEC, University of Wisconsin-Madison, MATT BEIDLER, Oak Ridge National Laboratory, BRETT CHAPMAN, University of Wisconsin-Madison, DIEGO DEL-CASTILLO-NEGRETE, Oak Ridge National Laboratory, NOAH HURST, University of Wisconsin-Madison — It has been demonstrated that resonant magnetic perturbations (RMPs) can suppress runaway electrons (REs). The RMP can introduce stochasticity in the plasma leading to enhanced transport. Munaretto *et al.* [1] illustrates that in low-q MST tokamak discharges, application of an $m = 3$ RMP leads to suppression of REs, while an $m = 1$ RMP does not have a strong effect. In $q(a) = 2.2$ discharges that include a $q = 1$ surface at $\frac{r}{a} = 0.5$, nonlinear MHD modeling with NIMROD predicts that the region of imposed stochasticity, in the outer region of the plasma, is much larger with the $m = 3$ RMP. We extend this work to include modeling of RE transport in the modeled magnetic topology. The role of the sawtoothing behavior of these discharges in transporting REs is also demonstrated, including modeling of the $q(a) = 2.7$ discharges where the $q = 1$ surface is separated from the stochastic edge. Development work to improve the performance of vacuum-field computations in vertical displacement events, in *e.g.* NSTX, simulations will also be reported. [1] S. Munaretto et al 2020 Nucl. Fusion 60 046024

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