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Quantifying the effect of stable modes in tearing mode turbulence
ZACHARY WILLIAMS, MATTHEW DICKERSON, Hope College — Tearing mode instabilities are ubiquitous in the study of plasmas, occurring both in laboratory fusion experiments as well as space plasmas. This work explores the possibility of capturing essential tearing mode physics through a reduced-model description. A growing body of literature has shown that many different flavors of instability-driven turbulence can be well-described via a truncated eigenmode decomposition, in which the nonlinear state of a plasma is approximated by only the most unstable eigenmode and a single stable mode. This approach is applied here to study resistive tearing-mode-driven turbulence, and the significance of the stable mode contribution is evaluated using the threshold parameter rubric as defined in Terry et al. 2006. The potential relevance of this approach to collisionless tearing modes is considered. This work is funded by the Michigan Space Grant Consortium, NASA grant #NNX15AJ20H.

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