Abstract Submitted
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Energy-Conservation Constraint in Stochastic Structural Stability Theory[1] J.B. PARKER, J.A. KROMMES, Princeton U. — The stochastic structural stability theory (SSST) is a technique, originally developed in the neutral-fluids community,[2] that can be used for understanding the statistical behavior of drift-wave–zonal-flow (DW–ZF) systems. The technique involves parameterizing the nonlinear DW–DW interactions as white noise while keeping the correct behavior of the DW–ZF interactions. The SSST equations describe the dynamics of the zonal flow and the quadratic statistics of the drift waves, which are then simulated numerically. The SSST has been applied to the Modified Hasegawa–Wakatani system recently,[3] and it has been demonstrated that the SSST equations exhibit ZF emergence. However, that work did not perform the DW–DW parameterization in a manner consistent with energy conservation. Here we apply the SSST to the Modified Hasegawa–Wakatani system while demanding that conservation of energy be satisfied. Preliminary results on how the energy-conservation constraint affects the dynamics of the SSST system will be reported.

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[2]B. F. Farrell and P. J. Ioannou, J. Atmos. Sci. **60**, 2101 (2003)
[3]B. F. Farrell and P. J. Ioannou, Phys.Plasmas **16**, 112903 (2009).

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