Abstract Submitted
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How Stochastic Structural Stability Theory Relates to Traditional Statistical Closures[1] J.B. PARKER, J.A. KROMMES, Princeton U. — The stochastic structural stability theory (SSST) is a technique[2] that can be used for understanding the statistical behavior of drift-wave–zonal-flow systems.[3] The method involves parameterizing the nonlinear DW–DW interactions as white noise while keeping the correct behavior of the DW–ZF interactions. The SSST can be interpreted as an intermediate step between the fundamental amplitude equations and conventional statistical closures. Unlike typical closures which describe only the mean-square ZF, the SSST retains a ZF amplitude. We discuss the relationship between the SSST and more traditional closures of the DW–ZF problem.[4] In particular, we examine the physical content of a closure of the SSST equations, illustrating with the Generalized Hasegawa–Mima equation. Studies are also made of the Hasegawa–Wakatani system, extending and clarifying the work of Ref. 3. The ideas are relevant for the ultimate control of microturbulence.

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