1116-92-1139 **Scott Hottovy*** (shottovy@math.wisc.edu), Department of Mathematics, 480 Lincoln Dr., University of Wisconsin, Madison, WI 53706, and **Samuel N. Stechmann**. *A Spatiotemporal Stochastic Model for Tropical Precipitation and Water Vapor Dynamics.*

A linear stochastic model is presented for the dynamics of water vapor and tropical convection. Despite its linear formulation, the model reproduces a wide variety of observational statistics from disparate perspectives, including (i) a cloud cluster area distribution with an approximate power law, (ii) a power spectrum of spatiotemporal red noise, as in the "background spectrum" of tropical convection, and (iii) a suite of statistics that resemble the statistical physics concepts of critical phenomena and phase transitions. The form of the model is a damped version of the two-dimensional stochastic heat equation. Exact analytical solutions are available for many statistics, and numerical realizations can be generated for minimal computational cost and for any desired time step. Given the simple form of the model, the results suggest that tropical convection may behave in a relatively simple, random way. Finally, relationships are also drawn with traditional statistical mechanics models (e.g. Ising model). Potential applications of the model include several situations where realistic cloud fields must be generated for minimal cost, such as cloud parameterizations for climate models or radiative transfer models. (Received September 17, 2015)