Nonextensive Turbulence Model for the SOI

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El Niño [Southern Oscillation Index (SOI)] and the turbulent nature of the ocean-atmosphere variability are linked through Beck turbulence model based on Tsallis nonextensive thermodynamics. *El Niño* intermittent behavior is studied through the behavior of a normalized increments of the index. The transition between the small time scale correlations, with non trivial partial distribution functions and the large time scales (of a Gaussian extensive homogeneous fluctuation type) is found to be rather well defined. The normalized increments distributions for different window scales can be well fitted with a time dependent parameterized χ^2-distribution. The intermittency exponent (κ) of the Kolmogorov log-normal turbulence model is found to be nontrivially related to the scaling exponent of the SOI volatility partial distribution function. The large value of κ points to a large number of energy cascades in the establishment of the turbulent process. A simple restoring force functional is found for writing the Langevin equation of the SOI evolution.