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Approximating long time statistical properties of dissipative complex systems.

It is well-known that physical laws for large chaotic/turbulent systems are revealed statistically. We consider temporal and spatial approximation of stationary statistical properties of dissipative chaotic dynamical systems. We demonstrate that appropriate discretization viewed as discrete dynamical system is able to capture asymptotically the stationary statistical properties of the underlying continuous dynamical system provided that certain natural conditions are satisfied. Examples that involve the two-dimensional Navier-Stokes system, the infinite Prandtl number model for convection, and convection in karstic geometry will be presented. (Received January 19, 2015)