Spectral perturbation for quenched random open dynamical systems: applications to extreme value theory and return-time statistics

Gary Froyland[1]

[1] (New South Wales University)

Abstract: We consider quenched random dynamics with small random holes and develop a spectral perturbation theory for the first derivative of the leading Lyapunov exponent of the transfer operator cocycle. This perturbative information is applied to create a quenched extreme value theory with random dynamics and random observation functions. Further, by considering random variables that count returns to shrinking random targets we show by spectral perturbation arguments that the limiting quenched distributions of multiple random extremes follow a compound Poisson distribution.