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Persistence as a spectral property.

A Gaussian stationary sequence is a random function $f : \mathbb{Z} \mapsto \mathbb{R}$, for which any vector $(f(x_1), \dots, f(x_n))$ has a centered multi-normal distribution and whose distribution is invariant to shifts. Persistence is the event of such a random function to remain positive on a long interval $[0, N]$. Estimating the probability of this event has important implications in engineering, physics, and probability. However, though active efforts to understand persistence were made in the last 50 years, until recently, only specific examples and very general bounds were obtained. In the last few years, a new point of view simplifies the study of persistence, namely - relating it to the spectral measure of the process. In this work we use this point of view to develop new spectral and analytical methods in order to study the persistence in cases where the spectral measure is 'small', or 'big', near zero. (Received September 18, 2016)