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Crossing Problems for Spectrum Estimates

I give estimates of the level crossing properties of nonparametric estimate of the power spectrum made from a sample of a purely non-deterministic random process. Level crossing problems have been extensively studied in the time domain but the procedures do not translate directly to the frequency domain. This talk introduces the problem, summarizes results to date, and shows that even when the original data is significantly non-Gaussian, they accurately describe the spacing and shapes of random peaks observed in spectrum estimates and so can be used to quantify coincidence detectors and false-discovery rates.