



An areal significance test for continuous wavelet spectral analysis

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Estimating continuous wavelet spectra, one faces the problem inherent to time/frequency analysis, that the results of conventional pointwise significance tests are hardly distinguishable from the results for background noise. We propose an areal significance test for continuous wavelet spectra that overcomes these difficulties of multiple testing: We utilize information about the patch area to decide whether a pointwise significant patch is really significant or indistinguishable from stochastic fluctuations. The significance test is studied in terms of sensitivity and specificity. For our investigation, we apply a framework of linear non-stationary stochastic processes defined in the wavelet domain, which by construction exhibit well defined time dependent spectral properties.