

## ON MULTISCALE DENOISING OF SPHERICAL FUNCTIONS: BASIC THEORY AND NUMERICAL ASPECTS\*

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**Abstract.** The basic concepts of selective multiscale reconstruction of functions on the sphere from error-affected data is outlined for scalar functions. The selective reconstruction mechanism is based on the premise that multiscale approximation can be well-represented in terms of only a relatively small number of expansion coefficients at various resolution levels. A new proof, including non-bandlimited kernel functions, of the pyramid scheme is presented to efficiently remove the noise at different scales using a priori statistical information, i.e. knowledge of the covariance function.

**Key words.** spherical wavelet theory, scalar multiscale approximation, pyramid scheme, spectral and multiscale variance-covariance model, hard and soft thresholding.

**AMS subject classifications.** 33C55, 42C40, 62-07, 65T60, 86A25.

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