

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

W. FREEDEN AND T. MAIER†

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.

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†University of Kaiserslautern, Geomathematics Group, 67653 Kaiserslautern, P.O. Box 3049, Germany, email freeden@mathematik.uni-kl.de, tmaier@mathematik.uni-kl.de, www <http://www.mathematik.uni-kl.de/~wwwgeo>; Correspondence to W. Freeden