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1003-41-1373      **Michael Schreiner\*** (schreiner@ntb.ch), University of Applied Science, Laboratory for Industrial Mathematics, 9471 Buchs, Switzerland. *Regularization by Means of Locally Supported Wavelets on the Sphere.*

The solution of pseudo-differential equations on the sphere (see [FGS]) which arise from geodetic or geophysical problems is a difficult task. The downward continuation of satellite data is ill-posed and, in addition, we are usually confronted with huge data sets. Thus, numerically efficient methods for the regularization of such problems are required.

In this paper, we present locally supported wavelets on the sphere which are constituted by infinite convolutions of locally supported zonal functions on the sphere (see [FS], [S]). By construction, these functions are infinitely smooth, so that they act as an appropriate tool for regularization schemes. In particular, we present regularization methods in form of tree algorithms.

References.

[FGS] W. Freeden, T. Gervens, M. Schreiner (1998). *Constructive Approximation on the Sphere (with Applications to Geomathematics)*. Clarendon Press, Oxford.

[FS] W. Freeden, M. Schreiner (2003). *Multiresolution Analysis by Spherical Up Functions*. *Schriften zur Funktionsanalysis und Geomathematik*, TU Kaiserslautern, Report No. 2.

[S] M. Schreiner (2004). *Wavelet Approximations by Spherical Up Functions*. Shaker, Aachen. (Received October 05, 2004)