



## **Local gravity field modelling from scattered data using multipole wavelets**

**R. Klees**, T. Wittwer, B. Alberts and P. Ditmar

Delft Institute of Earth Observation and Space Systems, Technical University Delft  
(rklees@lr.tudelft.nl)

In the contribution the problem of local gravity field estimation from scattered and non-homogeneous terrestrial, airborne and spaceborne data is considered. The approach is based on a representation of the disturbance potential using multiscale spherical basis functions. The gravity field parameters are estimated using least-squares techniques. The optimal discretization of the scale space is done automatically using Generalized Cross Validation techniques. For a nonhomogeneous data distribution, spatially adaptive estimators depending on the data distribution are developed using some thresholding techniques. These estimators are compared with a standard discretization of the position space using hierarchic subdivision schemes combined with Tikhonov regularization. The performance of the approach is investigated for various types of multiscale spherical basis functions and scattered homogeneous and non-homogeneous terrestrial and airborne gravity data. The results are compared with Least-Squares Collocation and least-squares techniques based on harmonic spline approximation, and solutions of Laplace equation in cartesian co-ordinates.