A new approach to the regularization of regional gravity field solutions in SRBF

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We present a purely data-dependent approach to the choice of the regularization parameter for regional gravity field solutions in spherical radial base functions. The method is based on the space-localization feature of the base functions and needs a prior gravity field solution to solve for the regional gravity field coefficients. However, to be independent of any prior model, we estimate an approximate solution using a realistic first guess for the regularization parameter. The final regularization parameter and therefore the final regional solution are obtained in an iterative procedure. We apply our methodology to real GOCE gravity gradients and assess the performance of the method in several test regions. Results show that our approach outperforms the existing methods such as the L-curve, the GCV and the VCE. In addition, the estimated coefficients represent the shape of the signal (geoid) in the target region and have therefore physical meaning. More details are given and the results are discussed in this contribution.