Recovery of Mass Transports in the Amazon Area from GRACE Data by a Novel Algorithm

Volker Michel

University of Siegen, Geomathematics Group, Department of Mathematics, Siegen, Germany
(michel@mathematik.uni-siegen.de)

We focus on the identification of mass transports in the Amazon area caused by seasonal variations as well as caused by floods and droughts. For the inversion of the GRACE gravity model for mass anomalies, we use a novel algorithm (the Regularized Functional Matching Pursuit, RFMP). It is able to combine different types of trial functions (e.g. global functions, such as spherical harmonics, with localized functions, such as spline basis functions). Moreover, the algorithm also includes a regularization technique to handle the ill-posedness of the inverse problem.
With the novel approach, the resolution of the result is locally adapted to the detail structure of the solution. This enables an improved localization of particular events such as mass transports. Some first numerical results are presented.