MASCON versus spherical harmonic solutions to global monthly time varying gravity field

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Satellite missions Gravity Field and Climate Experiment (GRACE) and its successor (GRACE-FO) plays very important role in nowadays research in geodesy, geophysics, hydrology, oceanography, glaciology and climatology. Various research centres adopted different procedures for processing the GRACE/GRACE-FO measurements in order to get the main final product – the global monthly gravity field model. Until now there have been developed and published two fundamentally different approaches to this problem. The first is well-known approach of spherical harmonic analysis and the second is more recent and more direct approach called in literature MASCON (Mass Concentration). The purpose of this contribution is to compare existing MASCON global monthly gravity field models with the selected models based on spherical harmonic approach. Comparison is performed in selected river basins and also in selected polar region. Chosen river basins differ both in size and seasonal changes of continental water storage to cover more situations. Comparison of different filtered versions of spherical harmonic solutions (DDK1 – DDK7) with MASCON solution is also performed in one of the analysed river basins. Differences are analysed and advantages and drawbacks of two approaches and of particular models are discussed.