



## **Computation of high-degree spherical harmonic models based on series of radial multipole potentials**

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With the satellite gravity field missions CHAMP, GRACE and the scheduled mission GOCE, the available altimetry data over sea and the steadily improving data quality over the continents, the calculation of spherical harmonic models of the Earth gravity field with high resolution is a challenge nowadays. In this contribution we focus on an alternative parametric representation, the sequential multipole analysis technique (SMA), which up to now has not been applied for global gravity field modelling. SMA is a very flexible method to approximate the gravity field globally or locally on the basis of irregularly distributed data of different types. There are analytical formulas to transform such a series expansion of radial multipole potentials into a series of spherical harmonics. The advantageous characteristic of the SMA, i.e., to fit its resolution to the resolution of the data will fully transformed into the spherical harmonics. Synthetic data are used to show the capability of this method.