Bayesian estimation of gravitational anomaly distribution from spectral data

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We propose to model gravity anomalies by a white noise process of spatially varying amplitude. From the sole observation of the degree variance of the Spherical Harmonics coefficients we propose to develop a Bayesian inversion for the determination of the amplitude within a layered model of the earth. The Bayesian approach allows the assessment of the uncertainties the so obtained fluctuation amplitudes of the anomalies. We discuss the geophysical implications of these findings.