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Gravitational signal and spectra of the crustal and the mantle layers

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Global Earth's density distribution models based on data from seismic tomography and crustal compilations still improve in the accuracy, and both in the lateral and vertical resolutions. We first evaluate the gravitational signal generated by such a model, LITHO1.0 (Pasyanos, 2014), and focus on its gravitational spectral properties. Because LITHO1.0 provides only about 10% of the total Earth's gravitational acceleration, we try to add a signal coming from the remaining part of the mantle (down to the CMB) with the help from the LLNL-G3D-JPS model (Simmons, 2016). Using the later we experiment with converting P and S velocities into the density information required in volume integrations. Then we examine how these models fit together and how their summed gravitational signal approaches the observed anomaly fields. The triangular parameterization used in both models is introduced in order to set up a global triangular surface-to-CMB density distribution model. This seems to be a useful starting point for testing various thermochemical scenarios in particular depths while constraining the outcome with modern satellite gravimetry data based on missions like GRACE and GOCE.