



## **A refined model of sedimentary rock cover over the Congo basin from the interpretation of GOCE gradiometric data**

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We aim to interpret GOCE gradiometric data over the Congo basin to refine the model of this region's sedimentary rock cover. First, the 5-parameter Helmert's transformation is applied to change the original Kadima et al. (2011) sedimentary model to a spatial distribution that closely resembles the gravity data over the basin. The transformation is defined by 2 translations, 1 rotation and 2 scale parameters that are searched for by the method of steepest descent. The same procedure is applied to the Laske and Masters (1997) 1x1 degree sedimentary model. The resulting transformed sedimentary models are only slightly changed with respect to the originals, but they greatly improve the fit of the gravity data over the sedimentary basin. However, there are still a few spatial features showing free-air gravity anomalies that remain unfitted by the sedimentary models. In a second step, the transformed sedimentary models are used to find the vertical density distribution of sediments. Although the free-air gravity anomalies can be optimally interpreted by a constant sedimentary density, such a model does not fit well the vertical gradient of gravity. Therefore, a density model is extended by including a linear increase in sedimentary density with depth, involving a least-squares procedure being applied to find the density and its gradient with depth by adjusting both gravity and vertical gradient of gravity.