

The Gravimetric Quasigeoid Model over Uganda

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SUMMARY

The gravimetric quasigeoid can be determined either directly by Stokes formula or indirectly by computing the geoid first and then determining the quasigeoid-to-geoid separation which is then used to determine the quasigeoid. This paper presents the computational results of the gravimetric quasigeoid model over Uganda (UGQ2014) based on the later technique. Another aim of this paper is to compare the approximate and strict formulas of computing the quasigeoid-to-geoid separation and evaluate their effects on the final quasigeoid model. Using 10 GNSS/levelling data points distributed over Uganda, the RMS fit of the quasigeoid model based on the approximate formula are 27 cm and 10 cm before and after a 4-parameter fit, respectively. Similarly, the RMS fit of the model based on the strict formula are 15 cm and 8 cm, respectively. The results show the improvement to the final quasigeoid brought about by using the strict formula to model more effectively the terrain in the vicinity of the computation point. Compared to UGG2014, UQG2014 is slightly better by approximately 2 cm both in terms of standard deviation and RMS after the 4-parameter transformation. Thus it is concluded that the gravimetric quasigeoid provides a better fit to GNSS/levelling data than the gravimetric geoid.