

Some aspects of Bouguer gravity determination – revisited

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Abstract: The Bouguer gravity disturbance gets a clear physical meaning only when it is based on ellipsoidal heights. However, applying closed expressions or Taylor series expansions for the normal gravity calculation is not permitted in areas of negative ellipsoidal heights. The paper investigates problems associated with using alternate reference earth models and compares the differences with respect to the classical reference ellipsoid approach. It is shown that the quasi-ellipsoid concept is a suitable way to handle negative ellipsoidal heights. The paper also discusses the consequences of gravity vector transformation into scalar quantities which are commonly used. Strictly speaking the latter are no harmonic functions but can be regarded as such in planar approximation.

Key words: scalar and vector gravity disturbance, normal gravity, reference ellipsoid, quasi-ellipsoid.

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