A new formula of the Gravitational Curvature for the prism

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Gravitational Curvatures (GC) are the components of the third-order gravitational tensor and physically represent the rate of change of the gravity gradient.

While scalar, vector and second-order tensor quantities of the Earth’s gravitational field have extensively been studied and their properties have been well understood [1], the first successful terrestrial measurements of the third-order vertical gravitational gradients have been recently performed in [2] by atom interferometry sensors in laboratory environment.

Possible benefits of the airborne third-order gravitational gradients for exploration geophysics are discussed in [3] while Brieden et al. (2010) [4] have proposed a new satellite mission called OPTical Interferometry for global Mass change detection from space (OPTIMA) sensing the third-order gravitational gradients in space.

Moreover, exploitation of GC for modelling the Earth’s gravitational field has been object of recent studies [5-7]. We extend the approach presented by the author in previous papers [8-10] by evaluating the algebraic expression of the third-order gravitational tensor for a prism. Comparisons with previous results [11-12] are also included.


