Geophysical Research Abstracts
Vol. 16, EGU2014-1284, 2014
EGU General Assembly 2014

The vertical derivative of normal gravity above the ellipsoid of revolution

Gerassimos Manoussakis

Dionysos Satellite Observatory, Dionysos Satellite Observatory, Surveying, Zografos, Athens, Greece
(gmanous@survey.ntua.gr, +30 210 7722670)

The vertical derivative of normal gravity at a specific point P is given by the known Bruns formula. The Bruns formula contains the mean curvature of a chosen normal equipotential surface. To use the Bruns formula for a chosen point above the ellipsoid we need to know the mean curvature of the normal equipotential surface passing through this point. In this presentation we show a simple approach to deal with this problem, by deriving a formula to express the mean curvature of the normal equipotential surfaces using three variables: geodetic latitude, geodetic longitude and geometric height. Using this formula which is valid for points on the Earth's surface we construct a more general form of the Bruns formula which allows the determination of the vertical derivative of normal gravity. The general form of the Bruns formula can be extended for any point above the reference ellipsoid of revolution.