Airborne gravity tests in the Italian area to improve the geoid model of Italy - DTU Orbit
(19/01/2019)

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Airborne gravimetry is an important method for measuring gravity over large unsurveyed areas. This technology has been widely applied in Canada, Antarctica and Greenland to map the gravity fields of these regions and in recent years, in the oil industry. In 2005, two tests in the Italian area were performed by ENI in cooperation with the Politecnico di Milano and the Danish National Space Center. To the knowledge of the authors, these were the first experiments of this kind in Italy and were performed over the Ionian coasts of Calabria and the Maiella Mountains. The Calabria test field is characterized by strong gravity variations due to the geophysical and topographic structure of the area. The ground gravity coverage is also quite dense. It was thus possible to compare airborne gravity with the ground observed values in order to check the precision of the airborne gravimetry. The second campaign was performed in an unsurveyed area centred on the Maiella Mountains, thus filling the data gap of this zone. Comparisons with existing ground data were also carried out in this area. After smoothing, the collected data have an accuracy of 2-3 mgal, as derived by cross-over analysis. Moreover, the collocation method applied to compare and merge ground-based and airborne data proved to be efficient and reliable. The standard deviation of the discrepancies between airborne data and collocation upward continued gravity is, in both cases, less than 8 mgal. In the Maiella test, the gravity field obtained by merging airborne and ground data using collocation also provides a more detailed description of the high-frequency pattern of the geopotential field in this area.

General information
State: Published
Organisations: Geodynamics, National Space Institute, Geodesy, Polytechnic University of Milan
Contributors: Barzaghi, R., Borghi, A., Keller, K., Forsberg, R., Giori, I., Loretti, I., Olesen, A. V., Stenseng, L.
Pages: 625-632
Publication date: 2009
Peer-reviewed: Yes

Publication information
Journal: Geophysical Prospecting
Volume: 57
Issue number: 4
ISSN (Print): 0016-8025
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.94 SJR 0.7 SNIP 1.18
Web of Science (2017): Impact factor 1.744
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.84 SJR 1.834 SNIP 1.882
Web of Science (2016): Impact factor 1.846
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.97 SJR 1.675 SNIP 2.281
Web of Science (2015): Impact factor 1.835
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 1.7 SJR 1.961 SNIP 1.787
Web of Science (2014): Impact factor 1.467
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.5 SJR 1.679 SNIP 1.54
Web of Science (2013): Impact factor 1.506
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 1.39 SJR 0.904 SNIP 1.297
Web of Science (2012): Impact factor 1.36
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes