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New gravity anomaly map of Taiwan and its surrounding regions with some tectonic interpretations

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Abstract

In this study, we compiled recently collected (from 2005 to 2015) and previously reported (published and open access) gravity data, including land, shipborne and satellite-derived data, for Taiwan and its surrounding regions. Based on the cross-over error analysis, all data were adjusted; and, new Free-air gravity anomalies were obtained, shedding light on the tectonics of the region. To obtain the Bouguer gravity anomalies, the densities of land terrain and marine sediments were assumed to be 2.53 and 1.80 g/cm^3, respectively. The updated gravity dataset was gridded with a spacing of one arc-minute. Several previously unnoticed gravity features are revealed by the new maps and can be used in a broad range of applications: (1) An isolated gravity high is located between the Shoushan and the Kaoping Canyon off southwest Taiwan. (2) Along the Luzon Arc, both Free-air and Bouguer gravity anomaly maps reveal a significant gravity discontinuity feature at the latitude of 21°20'N. (3) In the southwestern Okinawa Trough, the NE-SW trending cross-back-arc volcanic trail (CBVT) marks the low-high gravity anomaly (both Free-air and Bouguer) boundary.

Keywords: Free-air gravity anomaly, Bouguer anomaly, Taiwan

1. Introduction

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