

# Determination of Marine Gravity Anomalies in the Truong Sa Archipelago's Sea Territory Using Satellite Altimeter Data

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**Key words:** Geoinformation/GI; Marine cadastre; Remote sensing; Marine gravity anomalies; Satellite altimetry; Least Squares Collocation.

## SUMMARY

The purpose of this study is to determine the gravity anomalies on the sea within the Truong SA archipelago's territory from satellite altimeter data. To accomplish the proposal, the authors have collected and analyzed the satellite altimeter data to propose a satellite altimeter-based gravity anomalies determination procedure. An experiment was then conducted in the study area to evaluate the robustness of the procedure. The experimental results were validated by comparing with the in-situ ship-measured gravity data. Results show that, in order to determine the gravity anomalies from satellite altimeter data, the following steps: (1) the removal of the long-wavelength geoid height using the Global Earth Geopotential Models; (2) the removal of the mean dynamic topography; (3) the removal of the time-varying sea surface topography; (4) the calculation of the residual gravity anomalies emerged from the collocation method; (5) the long-wavelength gravity anomalies restoration by the Global Earth Geopotential Models, must be done. The experimental calculations were done for the sea territory around the Truong Sa archipelago (within the geographic coordinates 6.5°N to 12°N and 112°E to 117.5°E) with 52 cycles of Cryosat-2 satellite (from the 31st cycle to the 82st cycle). These marine gravity anomalies are also compared to 625 points of ship-measured gravity. The comparison shows that, the standard deviation between the Cryosat-2 satellite-derived gravity anomalies and ship-measured gravity anomalies is  $\pm 0.67$  mGal.

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