Coastal Gravity Anomalies from Retrackted Geosat/GM : A Case Study in Bali, Indonesia

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Key words: Engineering survey; Positioning; Reference systems; Geosat/GM, gravity anomaly, satellite altimetry, waveform retracking

SUMMARY

Coastal Gravity Anomalies from Retrackted Geosat/GM : A Case Study in Bali, Indonesia Dyah Pangastuti (dyah.pangastuti@big.go.id) Arisauna M. Pahlevi (arisauna.maulidyan@big.go.id) Abstract Geoid is the equipotential surface of the Earth's gravity field which best fits, in a least squares sense, global mean sea level. Geoid determination need gravity data in land and in the ocean. Gravity data in the ocean can be derived by shipborne gravity, airborne gravity, and satellite altimetry. Airborne gravity data have not measured in Bali, Indonesia. Shipborne gravity has covered some of the ocean of North of Bali. We used altimetry data from Geosat/GM to dense gravity data in the ocean of Bali. Subwaveform threshold is choosen to retrack the data which near of coast. The gravity anomalies in the ocean are derived from sea surface height (SSH) gradient by using Least Square Collocation (LSC). For data validation, we used shipborne gravity and EGM 2008, and we used DTU10 as comparison. Standard deviation of our model-shipborne gravity is smaller than DTU10-shipborne gravity, while standard deviation of DTU10-EGM2008 is smaller than our model-EGM 2008 due to DTU10 is used for EGM 2008 determination. Based on the validation result, our model is quite good to be used for geoid determination in the ocean of Bali. Indonesian geoid determination is a responsibility of Geospatial Information Agency of Indonesia (BIG) that i have been working in. Indonesia has many island which separates by wide ocean. By its geography, airborne gravity has limitation to cover all of the ocean of Indonesia, therefore, satellite altimetry can be used as solution to derive gravity anomaly in the ocean of Indonesia. Keywords: Geosat/GM, gravity anomaly, satellite altimetry, waveform retracking.