

Assessment of Tidal Effect on Gravity Measurements at Coastal Areas

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Traditionally, gravity measurements were observed by using conventional methods such as pendulum. Later, it was developed to various instruments including remote sensing techniques. CG-6 Autograv Gravity meter is an automated gravity meter that has a worldwide measurement range of over 8,000 mGals and a reading resolution of 0.0001mGal. This enables the user to operate in both detailed micro-gravity surveys and large scale regional or geodetic surveyors. Rain, wind and other meteorological variations directly impact the gravity measurements. Further, these gravity measurements employed various correction models such as temperature, tilt, tide, drift for reduce other influences. Gravity measurements taken near the sea could be directly affected by daily tidal changes. The aim of this study was to determine the effect of tides on gravity measurements and to eliminate the tidal effect from the gravity measurements. Gravity data were obtained from the CG-6 auto gravity meter at Colombo Port and Sabaragamuwa University continuously for 25 hours. Tidal data at the Colombo port were also collected simultaneously with the gravity data. Since the university is situated at inland area, there was no effect due to the tide observed. This data were used to validate the tidal effect. Bouguer anomaly correction was used for eliminate the tidal effect from the gravity measurements by computing the mass variation due to tide. Finally, after correcting for the drift correction, a good correlation between observed gravity measurements and mass variations due to tidal fluctuations was observed.

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