UNIVERSITI TEKNOLOGI MARA

POSITIONING PERFORMANCE ASSESSMENT USING DGNSS SATELLITE BASED AUGMENTATION SYSTEM (SBAS) WITH DIFFERENT SATELLITE COMBINATION

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AUTHOR'S DECLARATION

I declare that the work in this thesis/dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Postgraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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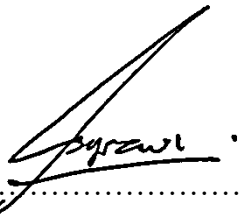
Signature of Student	:	 ……..
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ABSTRACT

Differential Global Navigation Satellite Systems (DGNSS) uses a fixed, ground-based reference station network which enables the broadcasting of differential information to the user to improve the accuracy of the position. It is important to provide a good indication of positioning and navigation performance by the availability of four-constellation integration with GPS, GLONASS, BeiDou, and Galileo. This study is to differentiate the accuracy of the results given between single satellite, double satellite, and triple satellite observation, which are GPS, GPS and BeiDou, and GPS GLONASS, and BeiDou using DGNSS Satellites Based Augmentation System (SBAS), that delivers the corrections and improved GNSS services through broadcasting messages from a geostationary satellite. Twenty-four hours static observation are performed with one DGNSS receiver for single, double, and triple satellite combination. The accuracy assessments are based on established reference point tied with Jabatan Ukur dan Pemetaan Malaysia (JUPEM) cors station. After that, the data were filtered to remove unreliable data recorded. Statistical analysis was done to support the comparison of positioning data, which is descriptive analysis, T-Test analysis, horizontal error analysis, vector distance analysis and normal distribution graph. The positioning comparison between single, double, and triple shows that the deviations from the reference coordinate for single satellite combination do not exceed 1.963 m for the northern component, 1.649 m for the eastern component. In the case of double satellite combinations, the deviation for a horizontal component is much smaller which it is 1.586 for northing and 1.586 m for easting while triple satellite combinations horizontal component do not exceed 1.163 m for northing and 1.576 m for easting. Thus, it meets the tolerance of the International Hydrography Organization (IHO) acceptable tolerance for doing any hydrography survey works, which is ±2 meter.

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