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Development and availability of a new positioning technique using GPS augmentation information from QZS-1 'Michibiki'

Toshihiro Yahagi[1*], Kenji Yoshida[1], Tomoo Toyoda[1], Hiroshi Yarai[1], Hiromichi Tsuji[1], Yuki Hatanaka[1], Hiroshi Munekane[1], Yuki Kuroishi[1]

[1]GSI of Japan

The first satellite of the Quasi Zenith Satellite System (QZSS) named 'Michibiki' was launched on September 11th 2010 successfully. Michibiki has a unique orbit in order to stay long hours above Japan region and provide services even under non-open sky environment like urban areas and mountainous regions. Michibiki transmits two types of signals. Ones are completely compatible and interoperable with existing and modernized GPS signals (L1-C/A, L1C, L2C and L5). By transmitting those signals, Michibiki is expected to improve GPS satellite constellation by working as an additional GPS satellite. And the others are Michibiki's original signals, L1-SAIF and LEX, which are used for broadcasting augmentation messages.

GSI has developed a new precise positioning technique by using the augmentation parameters on the LEX signal. The goal of this method is the realization of cm-level positioning by a single-frequency GPS receiver with about 15minites observation. The parameters on LEX signal are generated from real-time data collected by the GPS Earth Observation Network system (GEONET). We carried out experimental surveys by using data from Michibiki and drafted the geodetic surveying specification to encourage a use of this technique in Japan.

This presentation shows the details of the new developed technique, evaluation results of experimental surveys and drafting specification.

Keywords: QZSS, GPS augmentation, surveying