
[EJ] Evening Poster | S (Solid Earth Sciences) | S-GD Geodesy

[S-GD02] Geodesy General Contributions & Global Geodetic Observing System

convener: Koji Matsuo (Geospatial Information Authority of Japan), Yusuke Yokota (Japan Coast Guard, Hydrographic and oceanographic department), Takahiro Wakasugi (国土交通省国土地理院)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

In this session, general contributions from all areas of geodesy are welcomed. Topics of interest will include but not limited to recent advances in measurement techniques, reference frame realization, earth rotation or earth tide. In addition, this session also provides a forum for discussing GGOS (Global Geodetic Observing System) related observation programs, advancements of geodetic techniques, collaboration among various organizations in the world. Topics will include improvements of observing system and data analysis, participations in global programs, global reference frames and geodesy's contributions to society.

[SGD02-P04] Technical development for expanding availability of GNSS precise positioning in urban environment

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Keywords: Multipath, GNSS, 3D maps

Accuracy of GNSS positioning is easily degraded under severe conditions such as urban streets surroundings due to the blockage of the signals from GNSS satellites by tall buildings. Multipath effect, which is one of the causes of GNSS positioning accuracy degradation, is a known phenomenon that occurs in the urban area.

Geospatial Information Authority of Japan (GSI) has been developing new software-based techniques mitigating multipath effects in order to expand availability of GNSS precise positioning in urban environment.

By FY 2016, at first, we have selected some promising techniques from previous studies related to mitigating multipath effects. Secondly, we developed validation programs, then, we conducted GNSS observations for verification at the observation site and verified the multipath mitigation method under various observation conditions.

Consequently, two techniques using for selecting line-of-sight satellites with cutoff masks, “generated by fish-eye lens photos taken at observation stations” and “generated from 3D maps”, showed highly mitigating multipath effects. But the former needs some work other than GNSS observation, and the latter needs techniques to estimate initial coordinate value which is essential for using 3D maps.

In FY 2017, we developed techniques to estimate initial coordinate value, and verified how much accuracy it needed. In this presentation, we report the result of FY 2017.