

STT054-04

Room:105

Time:May 24 17:15-17:30

The use of Geonet combined with RTK-GPS on board the air/sea moving platform and its results

Jiro Segawa^{1*}

¹Department of Marine Engineering, TUMST

In gravity measurement on board aeroplane or ship the accuracy of positioning has as significant effect on the accuracy of gravity as the sensitivity and stability of gravity sensor and precision of levelling. In gravity measurement using aeroplane or ship the GPS receiver installed on board the moving vehicle is compared with the GPS receiver installed on land base station, and interferometric positioning is conducted using the paired signals. By this method we can obtain the position of the moving platform with the cm order accuracy. However, this sort of positioning is likely to be subject to the refraction of radio wave from satellites so that the interferometric positioning yields large errors as the distance of base line increases. The order of magnitude of such effect is about 1cm as long as the base length is shorter than 10km. If it is longer than 50km, the error reaches 10cm. In 2009, however, we experienced the least ionospheric refraction case when the error of positioning was smaller than 5cm whereas the base length was larger than 50km. We knew later that in 2009 the solar activity was minimum so that the effect from the ionosphere was minimum.

In case of gravity measurement on moving vessels it is something to build a base station over the area of survey. It may be necessary to keep a person at each GPS base station, which is a work not light to execute.

From January to March we got a chance to get on board the Shioji-Maru belonging to TUMST. We installed two GPS receivers on this ship, and measured the position of the ship. These GPS receivers are compared to GEONET receivers distributed near-by. Since Geonet bases are located

at about 10km spacings it is expected that a few cm accuracy in positioning is reached and demonstrated by our present researches.

Keywords: Positioning of cm accuracy, RTK-GPS, Accuracy of positioning of moving platform, GEONET, Base distance, Accuracy of gravity measurement