南極・昭和基地における重力の経年変化と季節変化

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Secular and Seasonal Gravity Changes at Syowa Station, East Antarctica

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Syowa station, East Antarctica has a category A point of the International Absolute Gravity Base Station Network (IAGBN(A)) in the gravity observation hut. The repeated gravity measurements with absolute gravimeter FG5 at Syowa have been for about 20 years since Geospatial Information Authority of JAPAN (GSI) firstly conducted in 1995 (JARE36). At polar region, it has occurred crustal uplift caused by glacial isostatic adjustment (GIA) after ice age. Multiple geodetic measurements at Syowa, including gravity measurement, is beneficial to understand GIA and Mantle viscosity. It is inferred that the lithosphere in this area deforms elastically with seasonal and annual dependency derived by an increasing and deceasing of snow accumulation. The impact may be large because snowfall around Syowa station has even increased for the past decade. Our aim is a detection of the secular and seasonal gravity change associated with crustal movement at East Antarctica. In recent years, we conducted absolute gravity measurements with FG5#210 of Kyoto university in 2012~2013 (JARE53) and 2015 (JARE56). JARE's FG5 measurement ordinarily is carried out in summer season in southern hemisphere. The measurement in 2012 (JARE53) was continued over a year. We report results of the secular gravity change for 20 years and the seasonal gravity change in 2012 at Syowa. The absolute gravity value is compared with other geodetic measurement (GPS, Doris, and so on) at Syowa and GIA model.

Table 1. Absolute gravity measurements with FG5 at Syowa station.

Year	FG5 equipment number	
	GSI	Kyoto Univ.
1995 (JARE36)	#104	
2001 (JARE42)	#203	
2004 (JARE45)	#203	#210
2010 (JARE51)	#104 #203	
2012 (JARE53)		#210
2015 (JARE56)	#203	#210

Figure 1. FG5 in the gravity observation hut at Syowa station.