

On the Calibration for GWR-Superconducting Gravimeter in China

He-Ping Sun Hou-Tze Hsu

Institute of Geodesy and Geophysics, Chinese Academy of Sciences,
54 Xu Dong road, 430077 Wuhan, China, email: heping@asch.whigg.ac.cn

Abstract

It is recognized widely nowadays that the superconducting gravimeter (SG) is a kind of best relative gravimeter with high observing precision, good continuity and stability, therefore it is also necessary for an SG to be calibrated, in order to convert the direct output (change in voltage) by using scale value (calibration factor) before getting the change of the real gravity field. By using a FG-5 absolute gravimeter in Institute of Geodesy and Geophysics, Chinese Academy of Sciences, Wuhan/China, we will introduce the calibration works done for 2 campaigns in this presentation: (1) from at 04:00:00, January 29, 1999 to at 06:26:20, February 1, 1999 and (2) from at 04:30:00, August 13, 2000 to at 04:39:40, August 16, 2000. The least square fit together with SG measurements is applied during the data processing.

Besides above mentioned, the weighted sum technique of the known main wave tidal parameters is also considered for the SG calibration. The monthly tidal gravity observations (from January, 1999 to December, 2000) and the synthetic tidal predictions are fitted by using the Chebyshev polynomial. The determined calibration factor is given as of -84.6243 mgal/V with precision of 0.2%. This precision is in the same order with the one of 0.15% determined by Hinderer (1998), and the one of 0.1% obtained by Francis (2000).