

昭和基地における地磁気観測データの評価

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An inspection of geomagnetic field observations at Syowa station, Antarctica

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Since 1966, Japanese Antarctic Research Expedition has conducted geomagnetic observations at Syowa station in Antarctica. The geomagnetic data at Syowa Station are open to the public on the website of National Institute of Polar Research (<http://polaris.nipr.ac.jp/~aurora/syowa.magne/magne.main.html>).

Geomagnetic variation data obtained by fluxgate magnetometer contains drift which can be caused by temperature change of magnetometer and/or tilt change of a position where magnetometer is installed. Therefore we need to correct variation data by using base line values. The base line values are obtained by absolute measurement with a theodolite for declination/inclination and a proton magnetometer for total force. The absolute measurements are carried out once a month at Syowa station.

However, we found that processes for correction of variation data by using results of absolute measurements at Syowa station are not entirely adequate. Absolute values of geomagnetic field have not been derived from the dataset. The purpose of our research is to enhance importance of the geomagnetic data at Syowa station by implementing appropriate correction procedures. To achieve this, we detect outliers of base line values by using statistical technique.

We also found the variation with time in base line values of horizontal and vertical components have considerable correlation with temperature at Syowa station. To take account of the criteria for detecting outliers and temperature dependency of the base line values, we propose the method to evaluate whether the result of absolute observation is appropriate.

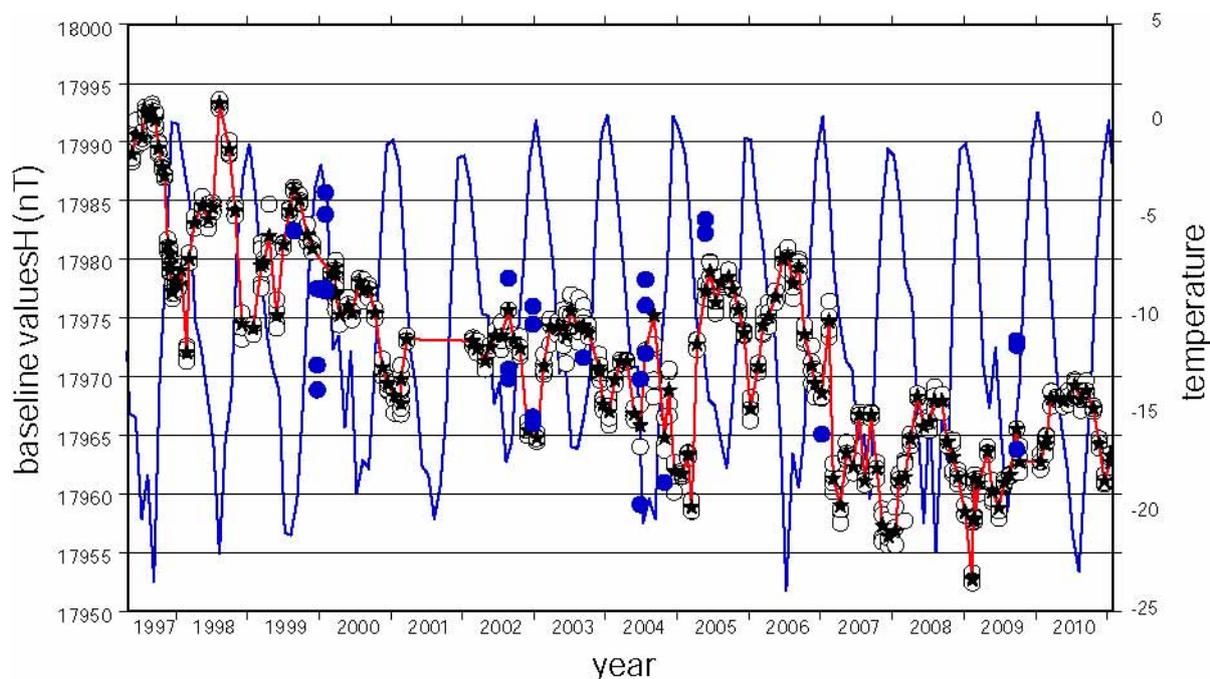


Figure. Changes with time in base line values of horizontal component and temperature at Syowa station. Open circles, stars and blue circles denote observed base line values, mean base line values and detected outliers respectively. Blue line denotes average temperature of each month at Syowa station.