Geophysical Research Abstracts
Vol. 13, EGU2011-14084-1, 2011
EGU General Assembly 2011

Observed regional magnetic anomaly drift in Sweden between 1965 and 1998

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The International Association of Geomagnetism and Aeronomy (IAGA) publishes International Geomagnetic Reference Field (IGRF) and its final, definitive versions (DGRF-year) in five years intervals to provide a world wide basis for reducing absolute magnetic field surveys to magnetic anomaly field. In NW Europe DGRF 1965.0 has been selected as a common reference of magnetic surveys, because the Dominion Observatory survey of Finland, Norway and Sweden was carried out in that year. The global secular variation is, as well, published by the IAGA as a part of the IGRF, but it differs from true secular variation of the Fennoscandian area and, therefore, is not commonly used there. Instead each country has made its own secular variation reductions based on geomagnetic observatory data.

The EUROPROBE BEAR project established a magnetometer network of 67 stations in the Fennoscandian Shield and nearby areas for June - July 1998. The average distance of the base stations was ca. 120 km and allowed more detailed analysis of spatial magnetic variations. In the GTK and SGU was decided to use this opportunity to measure tie lines for determining more precise levels of aeromagnetic maps in nationwide scales.

The aim of the Swedish tie lines survey was to provide one tie line for all Swedish 25 km x 25 km map sheets by diagonally crossing all its original survey lines. The line separation was 17 km. Magnetic total field was measured at an altitude of 60 m above the ground. In addition to the magnetic observatories, and BEAR and IMAGE stations, magnetic field variation was registered in four simultaneous moving base stations. The magnetic data was finally reduced to 1965.0.

Anomalies obtained 1998 and reduced to 1965 were compared with the Dominion Observatory survey anomalies in 1965, both referring to DGRF65 as the normal field. Differences of anomalies have been analyzed in terms of anomaly drift during 33 years between the surveys.