



Assessment of temporal magnetic field variations on the Aeolian Islands

B. Meurers, I. Schattauer, Ch. Stotter and R. Supper

Department of Meteorology and Geophysics, University of Vienna,
(bruno.meurers@univie.ac.at)

Temporal magnetic field variations can be determined by comparing the aeromagnetic survey results of different epochs. Generally, both horizontal and vertical coordinates differ between the magnetic data sets of different airborne surveys, therefore accurate 3D data interpolation of potential field data is required. The equivalent source concept offers an effective tool for field-continuation between irregular surfaces. The method by Ivan (1994) has been implemented for the use of unevenly scattered data. This approach does not need a-priori gridding, which could cause falsified results especially for airborne magnetic data recorded along spatially separated flight lines.

Temporal magnetic field variations in volcanic areas can be caused e.g. by changing the size of the magma chamber or by variation of the temperature field. They can even originate from variations of the induced magnetization. The accuracy of the field continuation depends on the sampling and truncation effects that inherently appear in the practical realization of equivalent source methods. Magnetic models of the area are used to check the accuracy and the significance of magnetic field variations in order to avoid wrong conclusions.

Presently, aeromagnetic data of the Vulcano-Lipari complex are available from the years 1999, 2002 and 2004. Additionally, a regional survey has been performed by Agip in 1985. Those data is important to be used for reduction of truncation effects.