Magnetic map of Sardinia - Preliminary results

Roberto BALIA
Cattedra di Geofisica Mineraria dell'Università, Facoltà di Ingegneria
Piazza d'Armi - 09100 Cagliari, Italy

Abstract: A magnetic ground survey of Sardinia has been carried out for total intensity and horizontal component of the geomagnetic field. A first examination shows some important manifestations and gives informations about the regional field caracteristics.

Résumé: On a réalisé une prospection magnétique de la Sardaigne pour l'intensité totale et la composante horizontale du champ. Une première analyse montre quelques importantes manifestations et donne des renseignements sur les caractéristiques du champ régional.

From July 1979 to June 1980, a magnetic ground survey of Sardinia has been carried out in the frame of the Italian "Geodinamica" Project. On the whole, about 230 measurements have been performed for the total intensity F and horizontal component H of the geomagnetic field, surveying all the Sardinian region except the areas of clear magnetic anomaly, with a mean density of about one measurement for 100 km^2. In the ground operations, an Askania QHM torsion magnetometer for horizontal component and a Geometrics G-816 proton precession magnetometer for total intensity have been employed. The measured values have been checked with reference to the first order stations network and reduced to the 1980.0 by continuous recording of the geomagnetic field elements D, Z and H at the Cagliari-Corongiu observatory. A first result of the research, the second order maps for the elements F, H and Z have been elaborated. The figure shows the total magnetic intensity map with contour intervals of 50 gammas.
From a first examination of the maps some important manifestations can be noted. In particular, in the North-East granitic region (Gallura), a maximum-minimum alternation of fairly good dimension is evident; another maximum is conspicuous in the Guspini-Sardara threshold and a wide minimum zone coincides with the Sulcis Basin. As regards the evaluation of the regional field, wich is one of the most important aims of the research, the preliminary calculations for the North-South gradient have

furnished a mean value of -3,459 γ/km (from North to South), without important variations with the longitude. On the contrary, for the East--West gradient, an important variation with the latitude has been verified. The mean value, computed with 24 East-West profiles,is -1,736 γ/km (from East to West), with values irregularly varying from -3,375 to -0,390 γ/km.