2D magnetization structure of NINIU using 3 components of Magnetic anormalies

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Three component magnetic survey was carried out at NINIU, Hokkaido in January,1999.
A flux-gate magnetometer, a ring laser yroscope, and GPS/RTK method were used.
The total accuracy for magnetic fields is about 10nT.
The flight levels selected were 300,500 and 800ms and the plane area is about 8km(EW) x 5km(NS).
The trend of surface geology of NINIU is generally north-south, then here we assumed the 2D magnetic strucure beneath the ground.
The procedure of analysis is as follows,
1. Select the east-west vertical section at the central part of the surveyed area.
2. Make the gridded data by solving teh Laplace equation.
3. At the same time,transform 3D(X,Y,Z) magnetic anomalies to 2D(Y,Z) anomalies.
4. Make the magnetic potentials on the quadrilateral boundary of surveyd area using Y(east component) and Z(downward component) anomalies and solve the Laplace equaton as the boudary value problem to get magnetic potentials at all grid points inside the area.
5. Make Y-magnetic potential and Z-magnetic potential to estimate the direction of magnetization.
6. 2D magnetization structure is solved using the Fourier method.
7. Compare other structures obtained using other metods.
8. Make the pseudo-gravity potential to estimate the magnetization structure.
9. Estimete the equivalent magnetic structure.

The definition of Y-magnetic potential f and Z-magnetic potential g in (y,z) plane
f(y,z)=S|Y(j,k)dl
g(y,z)=S|Z(j,k)dl
where Y and Z are the east and downward components of magnetic anomalies, (j,k) is (y,z) coordinate and l is the direction of magnetization, namely l(alfa,beta).
S|stand for the symbol of integration.
The magnetic potential anf the pseudo gravity potential are expressed by f and g, as
V=alfa∗f + beta∗g
U=S|Vdy = S|fdy + S|gdz
All of f,g V and U hold the Laplace equation, then if we know the boudary values for the area, they are the solutions of boudary value problems.
This time we will report of the results of the analysis mentioned above.