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New capabilities of aeromagnetic methods based on unmanned aerial vehicle for monitoring of geodynamic processes



Cherkasov, S.¹, Sterligov, B.¹ and Kurmaeva, V.²

¹Vernadsky State Geological Museum of Russian Academy of Sciences, 125009, Russia, Moscow, Mohovaya st., 11/11

²Vernadsky State Geological Museum of Russian Academy of Sciences, 125009, Russia, Moscow, Mohovaya st., 11/11, v.kurmaeva@sgm.ru

Identify the contribution of specific geological objects in total observed magnetic and gravitational field is the most important task at the stage interpretation of geophysical data. For this apply different various of transformation and conversion, allowing on the background of total anomalous field highlight, emphasize and strengthen the anomalies of different geological bodies [1].

«Upward continuation» is a mathematical operation that approximately recalculate the anomaly as if it had been measured in a survey at a greater height than was actually done. «Upward continuation» gives much the same result as would an aeromagnetic survey and so can be used to decrease the relative size of the anomalies of shallow, near surface bodies compared to those of deeper ones without the expense of flying a plane [2].

The initial magnetic field is the sum up of the field «upward continuation» and the residual field. But the quantitative interpretation of the field «upward continuation» and the recalculated the residual field cannot be carried out in principle, because they do not correspond to the real sources [3]. This problem is solved by measuring the magnetic field at different heights using unmanned aerial vehicle (UAV).

The results of a gradient aeromagnetic survey are presented in this paper, carried by UAV («GEOSCAN») with the optically pumping magnetometer located at the end of the wing.

References:

[1] Nikitsky V, Glebovsky U (1980) Magnetic survey. Directory of geophysics: 367

[2] Mussett A, Khan A (2000) Looking into the earth: an introduction to geological geophysics: 174-176

[3] Bloh U (2009) Interpretation of gravity and magnetic anomalies: 124-125

