

The 3-D modeling of the airborne survey data by the Integrated geophysical Airborne Survey System(IASS)

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In a geological survey, the geophysical method is an effective means for solving geological structure. Usually, the ground survey data is measured by one dimension or two dimensions. Investigating a wide area from the ground is very time-consuming, and it requires a huge amount of cost. Airborne survey can acquire a enormous quantity of data in a short time, without destroying the ground and contacting the ground. Moreover, the greatest advantage of airborne survey is being able to acquire the data by 3-D.

The IASS was developed for the purpose of investigating from the ground surface to the underground depths with sufficient accuracy, using four kinds of geophysical methods. Four kinds of geophysical data is various. We tried the 3-D modeling from the space to the underground in order to take full advantage of the airborne survey data acquired by the IASS. By the 3-D modeling, efficient practical use of data, improvement in geological structure interpretation accuracy, and the trial from qualitative evaluation to quantitative evaluation became possible. We attempted to acquire the data of 3-D magnetic field intensity in the air, alternating the measuring altitude. We put the airborne survey data of the Aso volcano in 2005 in a database. And in addition, geographical feature information also performed 3-D modeling. The integrated modeling data can express much geophysical data as real time by 3-D. Moreover, the sectional view in a favorite position can be displayed on demand. On the PC, we can do operation processing and can display the 3-D display of a topographical map, geographical feature analysis, the 3-D display of a field model, and creation of a solid model on real time.

The 3D modeling of airborne survey data can solve the problem of the conventional geological analysis. And it is effective in raising working efficiency, analysis accuracy, and quality. The 3-D modeling can change a qualitative geology interpretation into a quantitative thing. And an objective geology interpretation can be performed by combining the different type of the data, such as boring data and ground survey data, with 3-D modeling data. The visualization of 3-D data enables it further to share geology information between the same images.