

Development of an integrated airborne survey for disaster prevention

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An integrated airborne survey development program has started as a three year collaborative work by a leader organization of the Central Research Institute of the Electric Power Industry (CRIEPI) with collaboration organizations of Hokkaido university, Kyoto university, Kyushu university and Oyo corporation under the grant of Ministry of Education, Culture, Sports, Science and Technology (MEXT) in FY2003. In this program, we aimed to improve measurement system and develop integrated analysis of the following four airborne survey methods: electromagnetic, magnetic, gamma-ray spectrometry, and infrared image, in order to investigate and monitor underground conditions in rugged terrains for predicting and preventing natural disasters. In FY2003, we designed the measurement system and manufactured equipments for the survey. In FY2004, after a few test flights, we conducted a first survey flight at Aso volcano in Kyushu, Japan. In FY2005, we did a second survey flight at Aso to confirm reproducibility of the observed data and also surveyed around Bandai volcano in Tohoku, Japan, for studying applicability of the survey system to other fields. Aso and Bandai volcanoes are chosen as field test sites because of their well-known geology and accessibility for applying a helicopter. In the electromagnetic survey, we adopted GREAT-EM (GRounded Electrical source Airborne Transient EM) and succeeded to improve investigation depth down to 1,000 m in maximum from the ground surface. In the magnetic survey, we used two magnetic sensors with vertical separation of 9 m and produced detail magnetics and magnetic gradient maps. In the radiometric survey, we evaluated observed data quantitatively by referring the survey meter and compared with the surface geology. In the infrared image survey, we produced infrared image maps by mosaicking numerous image files. These maps were compared with temperature distribution on the surface.