

Airborne geophysical measurements in volcanic areas: state-of-the-art frontiers towards hazard prediction

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Starting from 1989 the Geological survey of Austria in cooperation with the Geological survey of Japan have started a complex airborne and ground geophysical research project in Italian active volcanic areas. The well known areas of Vesuvio, Campi Flegreii, Ischia, Vulcano, Lipari, Stromboli, Panarea and Salina have been investigated using airborne magnetic and gamma ray methods. In the first part of this talk, the most prominent results of these surveys will be presented.

Traditionally airborne geophysics was mainly applied for mineral exploration and sometimes for groundwater exploration. Within recent years research for natural hazard mitigation (mainly landslide and volcanic research) has claimed growing demand for high resolution airborne surveys. In many cases within these new fields of applications close line spacings down to 50m are used, difference measurements are applied or due to extreme topographic relief flight lines of constant altitude levels a.s.l. along topography have to be measured. Therefore to acquire the necessary high resolution, definition of new benchmarks for both, resolution of geophysical equipment and positioning is necessary. Additionally new methods in data processing, like upward continuation to arbitrary levels based on triangulated data, have been developed. Within this talk the state of the art for application of airborne methods to volcanic areas, based on our experience achieved during this project will be discussed, problems pinpointed and challenging ideas for the future stimulated.