



Application of newly developed gravimeters to monitor and study active volcanoes: the NEWTON-g project

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Gravimetry has been proven to be a very effective tool to monitor and study active volcanoes. Indeed, it is the only method able to supply information on the time changes of an important parameter: the bulk mass. Hence, gravimetry can provide unique information on the mechanisms driving volcanic uplift and subsidence and can spot processes at active volcanoes that might otherwise remain “hidden”, such as magma accumulation in void space and gas segregation at shallow depths. In spite of its potential, gravimetry is not widely adopted by volcano researchers or observatories, mostly due to the high cost and limitations of currently available gravimeters. In the framework of the NEWTON-g project (New tools for terrain gravimetry), we are developing a new measuring system, including an array of MEMS gravimeters, anchored to an absolute quantum device. This system will enable, for the first time, gravity measurements at high spatio-temporal resolution with fundamental implications for risk management. Besides the design and development of the new instruments, NEWTON-g involves a phase of field tests at Mt. Etna volcano (Italy), during the last two years of the project. Here, we present the background, motivation, goals, and status of NEWTON-g.