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Microgravity and GPS monitoring for the volcanic hazard.The 2001-2004 results in the case-history of Nisyros Volcano(Dodecannese archipelagos, Greece).

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The island of Nisyros is located in the eastern edge of the Aegean Sea, in the Dodecanese archipelagos, together with the little islands of Strogyli, Pahia, Pyrgousa and Yali. Nisyros is the youngest and eastern of the major Aegean active volcanic centres aligned along the volcanic arc composed also by the Methana Peninsula, Milos and Santorini islands. The pattern of the volcanic centres along this tectonic zone is according to the movements of the African lithospheric plate subducting under the Aegean Sea and with the clusters of distribution of the seismic epicentres. The speed rate of this movement is estimated in 4-5 cm/year, The stratovulcano of Nisyros is spread out for an emerged area of approximately 42 km2, and its diameter reaches an average of 8Km, determining an almost circular shape of the island. It lies above a basement of Mesozoic limestone and a thinned crust, with the Moho discontinuity located at a depth of approximately 27 km. The stratigraphy of this volcano is composed of a succession of calc-alkaline lavas and pyroclastic rocks, with a caldera of an average diameter of 4 km. The island has a persistent, albeit mild and latent, volcanic activity. The last hydrothermal explosive activity has been recorded along Lakki plain, the last one dated in 1887 when the crater of Mikros Polyvotis was created. In June 2001, a microgravity network was installed on the Nisyros volcano, with the aim to put in evidence any gravity variations and if any reporting changes in density values, would have correlated by geodynamic activity of area. In order to detect the relative movements due to different seismic-tectonic processes, some benchmarks were materialized. A GPS differential-mode topographic survey over these gravity bench-

marks started in 2002 and the Microgravity and GPS measurements were repeated in the follow years. GPS finding and gravity variation data, could be suggest a mass movements in that areas of Nisyros volcano were is more evidence the recent volcanic activity. These phenomena could be indicated as possible first precursors of a new volcanic activity. Combined data between geochemical analysis and gravity and GPS data will be really important to know better the presence of a new uplift phase and if the network established will be able to give always accuracy and representative data in the future to value the volcanic hazard of Nisyros island.

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