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Studies about the geodynamics of the etnean area by geophysic and geodetic techniques (GPS and VLBI).

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The correlation between volcanic and seismic activity of Mt.Etna and crustal deformations between Noto and Matera stations was analyzed. Crustal deformations were studied by means of VLBI (Very Long Baseline Interferometry) and GPS (Global Positioning System) space geodesy techniques; we selected the baseline between Noto and Matera stations, which crosses the etnean area. Moreover, the two stations are situated on different plates: Noto station is located on the African plate, Matera on the Adriatic microplate.

By analysing VLBI data we obtained the behaviour of the baseline from 1990 to 2004, representing the time variations of the distance between the two stations; the linear trend showed a general increasing, pointing out an extension of the crust between them. VLBI data are very sparse even if the time series was quite long; therefore, to densify the information, we analyzed GPS data. GPS technique performs continuous observations and we were able to highlight both extensions and compressions in details. We compared the baseline with the volcanic eruption of Mt.Etna and we found out that before the eruption the distance between the two stations increases, so there is extension between them, and during the eruption it decreases, so emphasizing crust's compression. The comparison with the strain release showed that the main seismic release happens during the extension of the crust before the eruptions so it helps the uplifting and the start of the event. The uprising of the mantle comes first of the eruptions and it causes the inflated crust lying over it and the volcanic fractures are opened and the magma up rises inside them. Moreover, this analysis showed that the

crustal deformation of etnean area is characterized by the geodynamics involving the movements of the plates where all the stations we studied are located