



Transpressive tectonic strain on the Lipari-Vulcano volcanic complex and dynamics of the “La Fossa” cone (Aeolian Islands, Sicily) revealed by last GPS surveys on a dense network

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Ground deformation resulting from the last two GPS surveys carried out in March 2006 and September 2007 on the Lipari-Vulcano volcanic complex are analyzed. Two networks lie on this area: the main Lipari-Vulcano network and the denser Vulcano-Nord one. Surveying strategies adopted for the main network during the last surveys allowed long baselines, from Lipari and Vulcano to the surrounding permanent stations in the S Tyrrhenian, to be processed with reliable accuracy. The fast-static strategy was instead adopted to survey the Vulcano-Nord network. Data from the main network has been processed in the ITRF05 frame and also in a local reference frame together with the Vulcano-Nord data. A significant N-ward motion of Vulcano island with respect to the ITRF05 has been detected. This motion abruptly decreases in the N part of Vulcano, suggesting a decoupling of the main Vulcano island from the rest of the volcanic complex. The analysis in the local reference frame evidenced a relative SSE-ward motion of Lipari and N part of Vulcano, with respect to the central and S Vulcano. This comparison also highlights a local uplift of the “La Fossa” cone. Data inversion was performed by Genetic Algorithms approach, using the horizontal strain measured on 258 GPS baselines, in order to not introduce bias due to the ambiguity in fixing the reference system and to neglect the vertical deformation of the “La Fossa” cone. In addition, strain tensor analysis was performed over the area covered by the Lipari-Vulcano network. Transpressive kinematics of the Lipari-Vulcano vol-

canic complex, with a main N-S contraction and a minor E-W extension only on the Southern part of Vulcano is revealed, resulting in a main compression with a dextral component of displacement on a NW-SE striking structure.