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Geophysical investigations of the Southeast Tyrrhenian Sea (Italy): high resolution DTM of the Marsili seamount

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The Tyrrhenian Sea is the small extensional back-arc basin in the Central Mediterranean Sea characterized by a peculiar volcanic activity due to the presence of two sub-basin: Vavilov and Marsili. The central sector of the Marsili sub-basin, younger than the Valilov, is occupied by the Marsili Volcano. On November 2007, a geophysical survey was carried out by IAMC-CNR research institute (Naples, Italy) in the southeastern Tyrrhenian Sea within the "Aeolian_2007" cruise onboard the Urania oceanographic vessel. During the second Leg of the survey, detailed multibeam data acquisition was carried out in order to obtain high resolution DTM of the major Seamounts of the southeast Tyrrhenian Sea. Here, we report a new, very high resolution Digital Terrain Model (DTM) of the summit area of the Marsili Seamount. Multibeam data acquisition was carried out with the use of the Reson Seabat 8160 multibeam sonar system, which properly works in the 50-3500 m depth range. The system, interfaced with a Differential Global Positioning System, is mounted on keel of the R/V Urania and is composed of a ping source of 50 KHz, 150° degree for the whole opening of the transmitted pulse and a 126 beams-receiver. The whole dataset has been processed with the use of the PDS2000 swath editor tool, in accordance with the International Hydrographic Organization standard, and subsequently reorganized in an MXN matrix (Digital Terrain Model, DTM) of 25X25 m of grid cell size. The total amount of area coverage consists in more than 500 squared Km of multibeam sonar data. The Marsili volcano shows a global sigmoidal trend extending for about 55 km in the N10°E direction. Both the eastern and the western sides shows equal average slopes. Throughout the framework, crater-like morphologies are not clearly visible. The western side of the seamount reveals furrowed channels showing peculiar rounded sections. The northern sector morphologically differs from the rest of the seamount and seems separated by lavic or gravitational valleys from the southern ridge sector.