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Geophysical exploration of the Marsili volcanic seamount: the ORION-GEOSTAR3 long-term experiment

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The Marsili Seamount is Europe's largest underwater volcano of Plio-Pleistocenic age, but little is known about its present geophysical characteristics and activity. ORION-GEOSTAR3 (EC- 6th FP) is the first long-term continuous geophysical and oceanographic experiment on the Marsili, where a deep sea observatory was deployed on the seafloor at the base of the seamount at 3320 m b.s.l., in the period December 2003-May 2005. Some of the instruments on board the observatory (relevant for this presentation) were: seismometer, hydrophone, gravity meter, magnetometer, water sampler for laboratory analyses, 3D single point current meter, ADCP, CTD and Ph sensor. The first successful scientific objective was to obtain long-term continuous recordings under a unique time reference. Our preliminary analysis shows that data are generally of good quality, and continuous (only a few gaps). As a first step we performed a classification of seismic waveforms, an analysis of chemical and oceanographic data, and a first look at the gravity meter data (time series, spectral analysis, background seismic noise). Analysis of individual time series has already shown interesting results, i.e. depth of the magnetic Moho under the Marsili, attenuation of recorded seismic body waves and indications for possible existence of hydrothermal circuit.We show examples of the preliminary data analysis and first results, and also some comparisons made among data from different sensors. Significant correlations between recorded time series could be related to activity and structure of the Marsili volcano. This is a starting point for the ambitious endeavour of describing the present state of the Marsili volcanic seamount.