



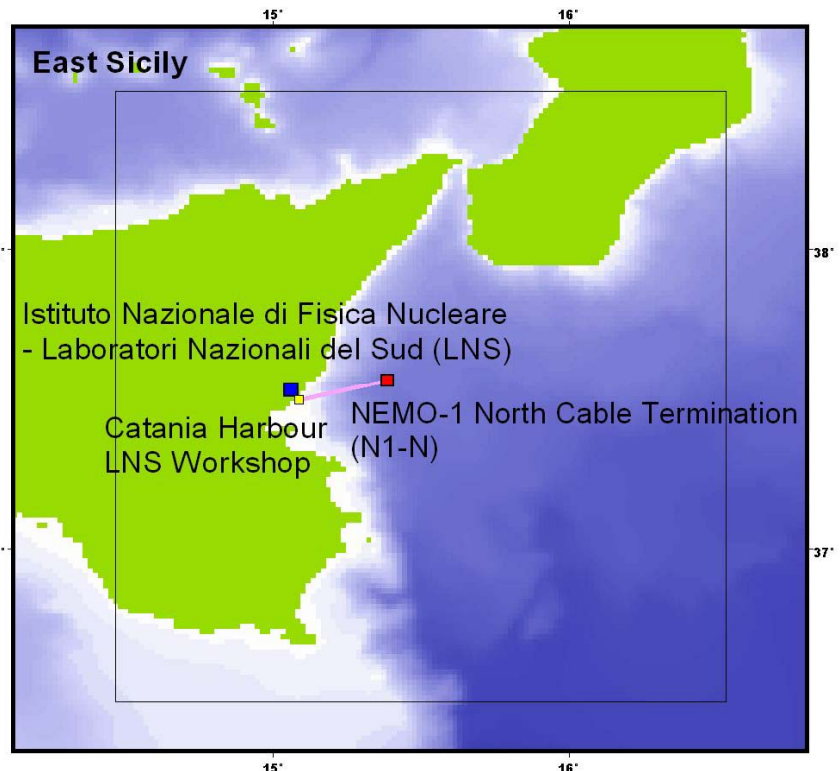
East Sicily region

An important offshore site close to Mount Etna, where the Italian SN-1 multidisciplinary observatory recently completed its first 6 month mission. The existing cable for NEMO neutrino experiment provides a focus for real-time data transfer and the integration of the seafloor observatory into land-based networks.

Background

Eastern Sicily has experienced disastrous seismic events, some of them accompanied by tsunamis, mostly generated by seismogenic structures lying at sea. The 1693 and 1908 earthquakes, both reaching an intensity of XI on the MCS scale, completely destroyed the cities of Catania and Messina. A large area, from the southern Calabria to Malta, was devastated. Both shocks were followed by a large tsunamis along the whole eastern Sicily coast, the Messina Straits and, probably, the Aeolian Islands.

In recent times Eastern Sicily has experienced events of minor intensity, many of which originated from off-shore tectonic structures, causing serious coastal damage. In December, 1990 an earthquake (intensity VIII MCS) caused severe damage in Augusta, south of Catania and numerous fatalities in the small town of Carlentini (Catania). This earthquake was accompanied by anomalous sea behaviour along the Augusta coast.



SN-1 seafloor multiparameter observatory managed by MODUS

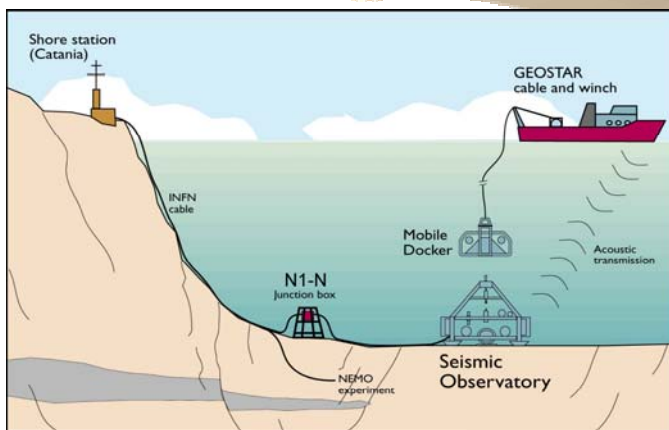
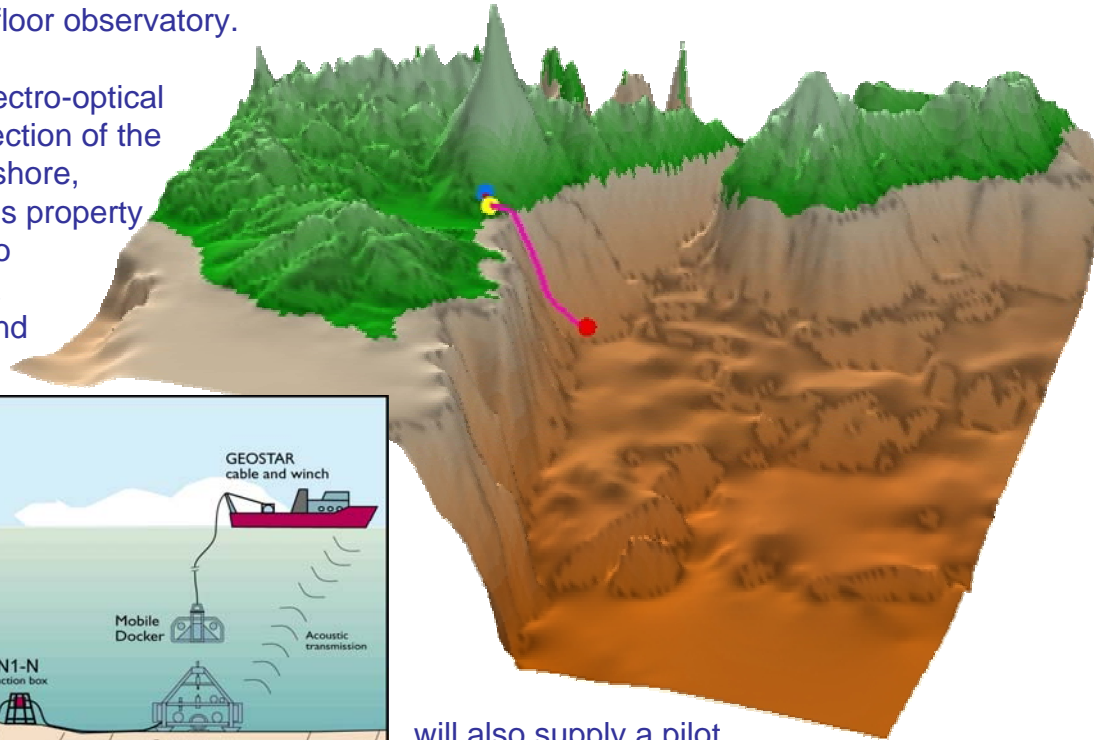
The Mediterranean basin is characterised by the collision processes between the African and the European plates; Sicily represents the natural connection between the Apennine and the North-African chains. The region is characterised by intense volcanic basaltic activity, probably connected to extensional tectonics responsible for the Iblean volcanism and the formation of the Etna edifice, or by frequent and strong seismic events. The adjacent Ionian region is characterised by the presence of a large submerged structure, the Malta escarpment. The existence of other important submerged seismic structures is confirmed by off-shore bathymetric and seismic prospecting; however,, medium-low magnitude marine seismicity, which could provide useful information on the characteristics of the area, is neither well detected nor localised.

Technology

The Eastern Sicily node will be based on SN-1, a deep seafloor multi-parametric cabled to shore observatory. SN-1 mainly focuses on geophysical, oceanographic and environmental data that are uniquely time referenced. A modular design allows additional sensors to be added as required.

SN-1 was developed in the framework of an Italian national project co-ordinated by INGV, and was validated during a long-term mission (7 months) in the period Autumn 2002- Spring 2003 in the Ionian sea, 25 km off the city of Catania at a depth of 2000m at the foot of the Malta escarpment. SN-1 is a spin-offs of the GEOSTAR projects (GEophysical and Oceanographic Station for abyssal research), which led to the development and successful operation of the first European seafloor observatory.

The underwater electro-optical cable for the connection of the observatory to on-shore, already deployed, is property of the Italian Istituto Nazionale di Fisica Nucleare (INFN) and



Sketch of SN-1 deployment procedure and connection to NEMO cable

will also supply a pilot experiment for the submarine detection of neutrinos (NEutrino Monitoring Observatory, NEMO). SN-1 is already equipped with a junction box for the connection to the wire of the interface-device.

Regional chairperson

Paolo Favali, Istituto Nazionale di Geofisica e Vulcanologia (INGV), Via di Vigna Murata 605, 00143 Roma, Italy – ph.:+39-06-51860341; fax:+39-06-51860338; geostar@ingv.it

National Institute hosting Cable project: Istituto Nazionale di Fisica Nucleare – Laboratori Nazionali del Sud (INFN-LNS), Catania, Italy

Node Project Committee: Emilio Migneco (INFN-LNS), Francesco Gasparoni (Tecnomare SpA), Claude Millot (LOB), Laura Beranzoli (INGV), Angelo de Santis (INGV), Hans Gerber (TFH).