



Integration of onshore and offshore seismological data to study the seismicity of the Calabrian Region

Antonino D'Alessandro (1), Ignazio Guerra (2), Giuseppe D'Anna (1), Anna Gervasi (1), Paolo Harabaglia (3), Dario Luzio (4), and Gilda Stellato (2)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Centro Nazionale Terremoti, Italy (antonino.dalessandro@ingv.it), (2) Università degli Studi della Calabria, Dipartimento di Fisica, Italy, (3) Università degli Studi della Basilicata, Dipartimento di Strutture, Geotecnica, Geologia applicata all'ingegneria, Italy, (4) Università degli Studi di Palermo, Dipartimento di Scienze della Terra e del Mare, Italy

The Pollino Massif marks the transition from the Southern Apenninic to the Calabrian Arc. On the western side it is characterized by a moderately sized seismicity (about 9 $M > 4$ events in the last 50 years), well documented in the last 400 years. The moment tensor solutions available in this area yields, mainly, normal faults with coherent Southern Apenninic trend. This remains true also for the events that are localized on the calabrian side of Pollino, South of the massif. In most of the Sibari plane, seismic activity is very scarce, while it is again rather marked on its southeastern corner, both onshore and offshore. The above observations point to the perspective that the stress field of a vast portion of Northern Calabria still resembles that of the Southern Apennines. In this frame, it becomes important to investigate the offshore seismicity of the Sibari Gulf and the deformation pattern within the Sibari Plane. The latter might function as a hinge to transfer the deformation of the extensional fault system in the Pollino area to a different offshore fault system. Since return times of larger events might be very long, we need to investigate the true seismic potential of the offshore faults and to verify whether they are truly strike slip or if they could involve relevant thrust or normal components, that would add to the risk that of potentially associated tsunamis.

Despite their importance in the understanding of the seismotectonic processes taking place in the Southern Apenninic - Calabrian Arc border and surrounding areas, the seismicity and the seismogenic volumes of the Sibari Gulf until now has not been well characterized due to the lack of offshore seismic stations. The seismicity of the Calabrian is monitored by the Italian National Seismic Network (INSN) managed by Istituto Nazionale di Geofisica e Vulcanologia and by the Calabrian Regional Seismic Network (CRSN) managed by the University of Calabria. Both the network comprise only on-land seismic stations. The lack of offshore stations prevents accurate determination of the hypocentral parameters also for moderate-strong earthquakes that occur in the Calabria offshore.

With the aim of investigate the near shore seismicity in the Sibari Gulf and its eventual relationship with the Pollino activity, in the early 2014 will start a project for the improvement of the Calabrian Seismic Network in monitoring the Sibari Gulf area by deploying several Ocean Bottom Seismometers with Hydrophone (OBS/H). For this experiment, each OBS/H is equipped with a broad-band seismometer housed in a glass sphere designed to operate at a depth of up to 6000 m and with an autolevelling sensor system. The OBS/Hs are also equipped with an hydrophone. Analogical signals are recorded with a sampling frequency of 200 Hz by a four-channel 21 bits datalogger. In this work, we plan to present the preliminary results of the monitoring campaign showing the largest improvement in hypocenter locations derived from the integration of the onshore and offshore seismic stations.