

FS ALKOR AL532 (Catania – Catania)

Weekly report 27.01. - 02.02.2020

RV ALKOR reached the port of Catania on the morning of the 27 January 2020 with a delay of eight days. On the same day the scientific team embarked and we started to load and assemble the scientific instrumentation. We left the port on Wednesday and started the cruise AL532 seven days after the original schedule. Our team consists of four participants from GEOMAR Helmholtz Centre of Ocean Research Kiel and one participant from the Etna Observatory of the Istituto Nazionale Geofisica e Vulcanologia in Catania.

Mount Etna at the east coast of Sicily is Europe's largest and most active volcano. Satellite-based ground deformation observations (GPS, Interferometric SAR) show that the volcano's south-eastern flank slides seawards at a rate of about 3 cm per year. Recent seafloor geodetic measurements suggest that also the submerged part of the flank is sliding at a similar rate. However, this observation is spatially limited to one point along the fault that represents the boundary between the stable and unstable volcano flanks. The aim of this research cruise is to map this fault system at the best possible resolution. We use a multibeam echosounder carried by the autonomous underwater vehicle (AUV) Abyss of GEOMAR. In addition we collect hydroacoustic data with ship-based multibeam echosounder. With the microbathymetric maps of the seafloor we will be able to identify the width and length of the fault system that hosted deformation measured by the seafloor geodetic network and to establish a potential link to larger regional tectonic structures.



Figure 1: Left: AUV Abyss at the sea surface after its second dive with Mount Etna in the back. Right: The science team on-board RV ALKOR AL532 (Alessandro Bonforte, Torge Kurbjuhn, Emanuel Wenzlaff, Morelia Urlaub and Anja Steinführer).

After a short transit from the port to the working area, AUV Abyss was deployed for a three-hour test dive. In the meanwhile we deployed two transponders to improve the AUV's navigation. No major problems were identified from the test dive so we could re-deploy the AUV before dinner for its first science dive. We used the night to perform a survey near the coast with the ship-based multibeam. The following two days had roughly the same schedule: Recovery of AUV Abyss in the morning, CTD station, ship-based multibeam survey, deployment of AUV Abyss before dusk, ship-based multibeam survey. Unfortunately, AUV Abyss sent an error message a couple of hours after its fourth

deployment and had to be recovered in the night from Friday to Saturday. It was not possible to fix the error on board the vessel. Therefore, we used the remaining time to recover two transponders and conduct two surveys with the ship-based multibeam. The science program ended on Sunday at 9:15. After a short transit we arrived at the port of Catania.

We were able to make the most of the shortened cruise owing to the excellent weather conditions and also to the efforts of the crew of RV ALKOR. We would like to sincerely thank the Captain and the entire crew for their help and the supportive and friendly environment.

Best wishes on behalf of all cruise participants

Morelia Urlaub

Catania 2 February 2020