

POS524 – GrimseyEM – Grimsey Vent Field, Iceland – 15.6.2018

1. Weekly Report

We are on board the Poseidon (cruise POS524—GrimseyEM), currently located in the survey area which lies just north of Iceland close to Grimsey island to study the active Grimsey hydrothermal field by applying electromagnetic measurements (MARTEMIS coil system, OBEM receivers), heat flow measurements (2.2 m sensor length) and gravity coring (2.8 m probe length).

In general, electrical conductivity anomalies within the seafloor may be caused by mineralizations and also through hot, saline fluids that are occupying the pore space and are possibly expelled from the subsurface through hydrothermal vents. Our current study aims to investigate if the newly-developed MARTEMIS system is capable to map the active hydrothermal system in the vicinity of the Grimsey vent field. Moreover, the EM experiments can not only deliver insights regarding the structure of the hydrothermal field, but may also be able to detect mineralizations at greater depths. The interpretation of the EM measurements is supported by additional geophysical measurements using a heat flow probe and CTD device and geological gravity core measurements.

After departing from Reykjavik (7.6) our transit was delayed by several hours due to a prolonged field of floating ice that had to be circumnavigated by Captain Günther. Arriving late on the 8.6, we were able to start preliminary work in the survey area on 9.6, including CTD measurements, installation and configuration of the USBL systems and deployment of 12 OBEM receiver stations. The planned measurements program started on the 10th of June. In the following days we were able to

- take 5 gravity cores (4 x 3 m and 1 x 1 m)
- measure one profile consisting of six stations with the heat flow probe
- and measure 12 profiles using the MARTEMIS system with a complete length of approximately 16 km.

A first glance at the CTD data, heat flow data and gravity cores indicates that the Grimsey vent field is currently in a very active phase and that the active area seems larger than the results of past cruises (POS229, POS253, POS291) imply. For the remaining methods, a data back-up is completed, but results are currently not available.

In the past 36h, we were forced to leave the survey area and seek shelter in a near fiord due to severe winds and waves. Tomorrow we will recommence with the scientific program and hope that the last working week will be successful despite the moderate weather forecast.

Crew, technicians and scientists are all doing well, for which we are confident to report on further successful scientific experiments and first results in the upcoming report.

Sebastian Hölz