

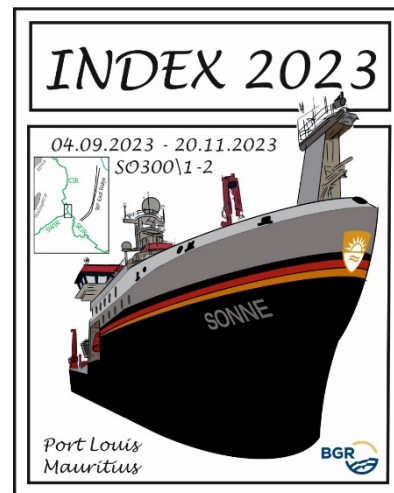
RV SONNE cruise SO300/1

INDEX2023

4 – 28 September, 2023

Port Louis (Mauritius) – Port Louis

At sea, 26°27'S, 71°41' E



Weekly Report No. 2 (11/09 – 17/09)

After arriving in the working area last Sunday, the survey of the largest known field of massive sulphides on the Southeast Indian Ridge had begun with the deep-towed bathymetry system HOMESIDE, which was completed as planned on Tuesday, 12.09. in the midday hours. Afterwards, the GOLDEN EYE electromagnetic profiler deployed on the seafloor was prepared for deployment and brought into the water. This generates magnetic fields with a coil system, which in turn induce electric currents in electrically conductive areas of the seabed. Since massive sulphides are among the most conductive types of rock, they can be imaged in the subsurface using this method.

After a technical problem at the GOLDEN EYE had occurred during the night of 12.09., the HOMESIDE system was again deployed to further explore the area of an interesting structure found in the data at the western edge of the previously surveyed area. It turned out that traces of a hydrothermal fluid seepage were detectable in the water column, i.e. a strong indication of a small active area outside the previously known zone of inactive massive sulphide deposits.

From 13.09. onwards, the GOLDEN EYE was successfully deployed to survey the core areas of the massive sulphide field with the coil system. This work takes place at low speed at a constant distance of two metres above the seabed and takes a lot of time due to the unusually large extent of the field being investigated. "Flying over" the study area in this way is only possible on the research vessel SONNE with the heave compensation installed here, which automatically compensates for the movements of the ship in the swell relative to the measuring cable.

In the night from 14 to 15 September the weather, which had been very good until then, changed. Within a few hours, strong and gusty winds from southern to eastern directions developed, which made the profile runs very difficult and at times forced interruptions of the measurements. However, with the great commitment of the officers on the bridge and the winch operators in the laboratory, as well as profile directions adapted to the wind direction, it was possible to cover the large measurement area piece by piece.

A special highlight was the direct crossing of the already suspected active hydrothermal vent at the western edge of the survey area with the GOLDEN EYE. In the cameras of the system,

the magnificent faunal associations and the dark clouds of hot fluid typical of the "black smokers" could be admired.

On the evening of 17.09., this exceptionally long instrument deployment over more than five days is still ongoing, but nearing completion. It is hoped that by tomorrow morning the wind and sea will have calmed down enough for GOLDEN EYE to be safely taken back on board. After that, a transit to a hydrothermal field located almost 200 km further north is scheduled.

Everyone on board is doing well despite the rough seas.

Best regards on behalf of all participants,

Udo Barckhausen, Federal Institute for Geosciences and Natural Resources (BGR)
Chief Scientist



View of an active "black smoker" with typical vent fauna in the front camera of the GOLDEN EYE. Photo credit: BGR