FS SONNE cruise SO301

SCIROCCO & KABA

22 November, 2023 – 4 January, 2024

Port Louis (Mauritius) – Port Louis

At sea 25° 2.6‘ S, 70° 2.2‘ E

Weekly Report Nb. 3 (4/12 – 10/12)

On 4 December from 8 a.m. to 6 p.m., we deployed the almost 8 km long seismic streamer for the first time - a first in German academic research multichannel seismics. The streamer consists of 39 active sections with 468 channels at a hydrophone group spacing of 12.5 metres plus 12 sections with 288 channels at a group spacing of 6.25 metres. The streamer sections were stored on 3 winches, two of which are in 20-foot containers with excess height, and were assembled and supplemented with additional streamer elements and weights for buoyancy control. Depth control units with compass and units with transponders for acoustic positioning are used in addition to the end buoy with GPS for precise positioning of all channels, which is calculated by the navigation system. The towed magnetometers were then deployed on the port side, the acoustic system for whale detection on the starboard side, and the two airgun arrays over the rails on the sides.

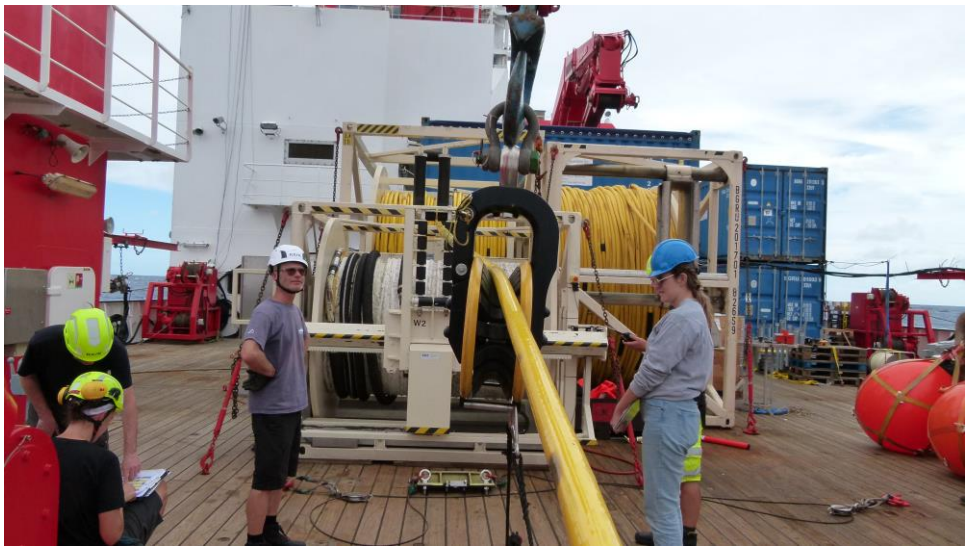
On the following day, the southernmost profile, which extends as a reference profile from the Indo-Australian Plate over the Southeast Indian Ridge to the Antarctic Plate, could be measured with a stationary shotpoint distance of 50 metres. During the following turn, the streamer became entangled with an airgun cluster due to wind and waves. After the streamer could be freed by lowering it at slow speed, we retrieved part of the streamer to replace a defective depth control unit. Since then, the streamer has been stable at a target depth of 12 metres. The risk of collision between the streamer and the airguns during turns has been eliminated by the winch taking over the streamer pull and in addition the streamer being lifted by a block in the A-frame and thus only entering the water behind the airguns. This method, which was new to us, proved its worth in the next turns, so that the curve radius could be gradually reduced again. During the turns, time-controlled shots are taken at one-minute intervals in order to provide optimum source signals for the recording array of 41 ocean bottom seismometers on and around the oceanic core complex (OCC).

By now, the main regional profiles in a SW-NE direction have been surveyed continuously for six days without data loss in wind speeds of around 4 Bf and swells of 2 to 3 m, before the perpendicular profiles and additional lines for a denser coverage are to be surveyed next week. The permanent optical or acoustic whale observation has not yet resulted in any sightings while shooting.

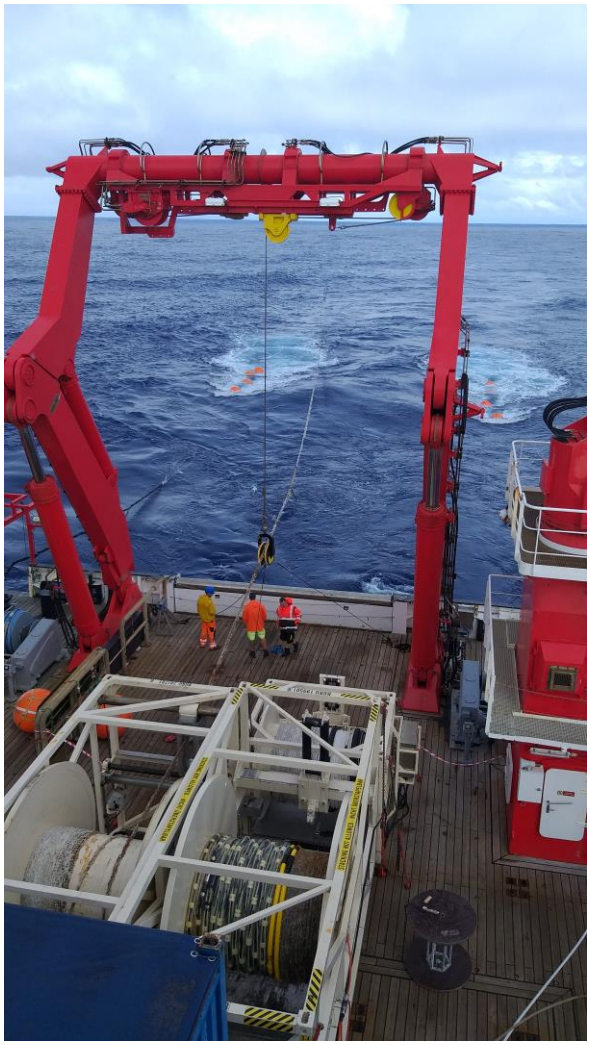
With best wishes from the 2nd Advent on behalf of all cruise participants

Martin Engels, Federal Institute for Geosciences and Natural Resources (BGR)

Chief Scientist



Streamerwinches during deployment (Foto: Stefan Ladage)



Sailing turns during line change (Foto: Martin Engels)