



AL575

1st Weekly Report

27 June – 3 July 2022



Alkor cruise 575 takes place in the framework of the DAM project GEOSTOR. GEOSTOR estimates the potential for CO₂ storage in subseafloor formations of the German North Sea and evaluates the associated environmental risks. In this context AL575 contributes to a better understanding of the propensities of leakage from the storage formations along boreholes that pose potential migration pathways. During the research cruise we will be visiting a few of the more than 17,000 abandoned wells in the North Sea in the search for gas bubble releases in the vicinity of wells using hydroacoustic multibeam and singlebeam systems. GEOMAR's remotely operated vehicle ROV PHOCA is deployed to sample and quantify gas fluxes at identified emission sites.

ROV Phoca and the scientific equipment were loaded onto RV ALKOR on Monday, 27 June, at GEOMAR's eastshore premises. After installing the scientific equipment in the ship's laboratories and a mandatory harbour test of the ROV the next day at the west shore pier of GEOMAR, we left Kiel fjord and travelled through the canal to Brunsbüttel on Wednesday. After steaming for more than a day through a rather calm North Sea, we arrived our working area in the British sector of the North Sea at midnight on 30 June. Here we deployed the CTD water rosette sampler to collect a sound velocity profile of the water column and took several water samples. After calibrating the Elac Seabeam system that had been installed on RV ALKOR earlier this year, a first hydroacoustic survey across abandoned wells as well as a subsurface salt dome structure was conducted in the search for gas bubble emissions. The survey confirmed methane emissions known from previous cruises, but also detected a few new ones. Hence, the next morning we deployed ROV Phoca to dive to a few of the identified locations to sample the emitted gas and measure the fluxes. This is not an easy task because in many instances even strong "flare" signals in the echosounder data correspond to only a single stream of gas bubbles escaping the seafloor. And, as it turned out during the dive, around high tide this bubble stream can become rather intermittent. However, with the help of our skilled ROV team, we were able to get the desired samples.

We have repeated this working procedure with hydroacoustic survey at night and ROV-guided sampling during daytime at identified gas release sites at selected well locations for two more days now, only briefly interrupted by strong wind and higher waves on Friday evening. Everyone's spirit on board is very good and we are eagerly looking forward to new samples and discoveries.

On behalf of all AL575 participants,

Matthias Haeckel



One of the many oil & gas production platforms in our working area. (Photo: M. Haeckel)



ROV-guided gas sampling and gas flux quantification. (Photo: ROV Phoca team)