Cruise METEOR M166

Emden – Emden, 09.09.2020 - 08.10.2020

3. Weekly report, 20. - 27. Sep. 2020

At the beginning of the third week of our cruise, on Monday 21 September, wind and waves slowly began to decrease. So, we could leave the bay, where we were safely waiting. We started with CTD work Monday evening. During this week, we conducted another 80 CTD stations in the Western Valley (141 stations in total, updated station map in Fig 1).

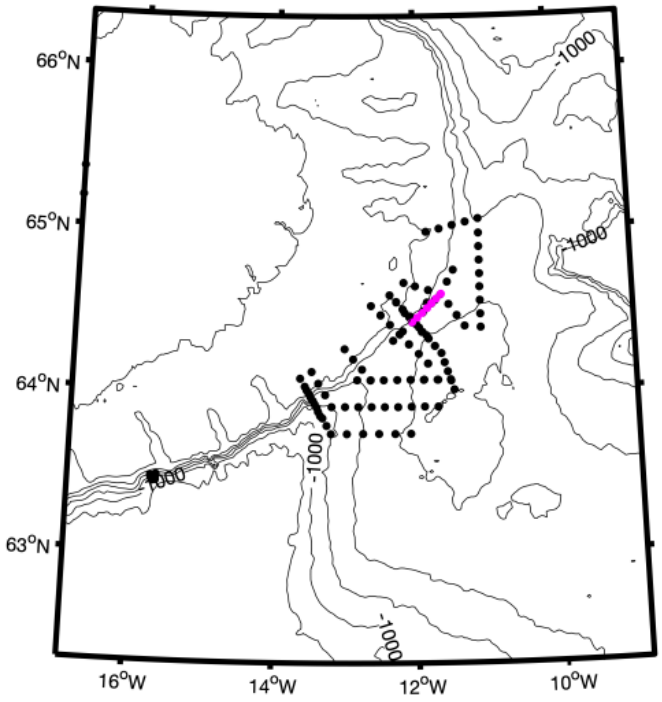

Figure 1. Station map, Western Valley region, at the end of the third week. Magenta colour shows the position of the CTD section in Fig. 2.

Most of the time, we could capture the overflow water or the water masses coming from Faroe Bank Chanel in our CTD sections, as well as North Atlantic inflow water. We also recovered two short-term ADCP moorings to prepare them for the long-term deployment.

A first plot of the ADCP velocity data (Fig. 2) presents clear tidal currents, which we will filter with our post processing activities. It is also a permanent near-bottom current towards the southwest visible, of which the vertical extension varies (visible from the blue colors in both panels of Fig. 2).

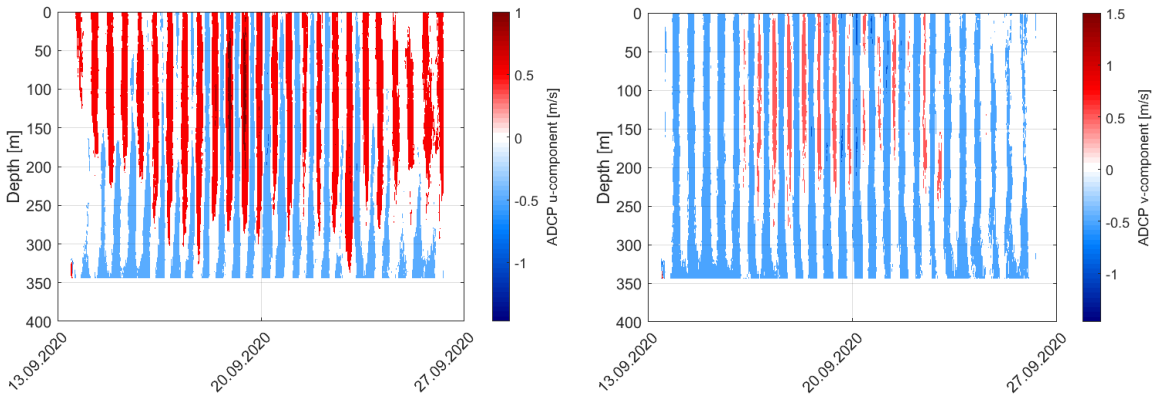

Figure 2: ADCP raw data of the southern central mooring. Right and left panels show west-east and south-north velocity components, respectively. Westward and southward are negative.

Furthermore, we were working on analyses of the data obtained from our CTD measurements. Supported by our colleague in the institute, who developed large parts of the post-processing software we apply, we did further quality control and post-processing on our collected CTD data. As an update, Fig. 3, which was presented in the last report, shows a section plot of potential density along the section between stations 15 and 21 (marked in magenta color in Fig. 1, left to right corresponds north to south). The 27.8 kg/m3 contour line depicts the interface to the dense overflow water (> 27.8 kg/m^3). The section plot now suggests continuous overflow without any interruption but a weaker period (station 19).

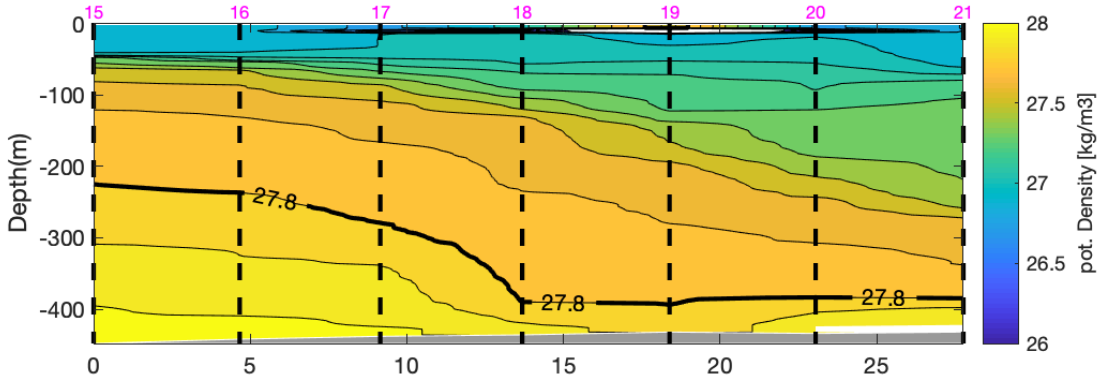

Figure 3: Potential density (kg/m^3) along the section of stations 15-21. The bold isopycnal 27.8 kg/m^3 is commonly used as the upper boundary of the overflow layer.

Due to high waves in the region, we had to stop with the CTD cast on station 141 and leave the Western Valley on Saturday evening for the southeastern coast of Iceland. There, we were able to run two short CTD sections looking for the overflow water downstream at the slope of the Iceland shelf.

In the night from Sunday to Monday, we started our way back for the recovery of the first of our deployed moorings on Monday morning.

Figure 4: CTD rosette touches the ocean surface. Lower picture: released floating mooring just before pick-up. Pictures by Vincent Urban.

Best wishes on behalf of all participants,

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R/V METEOR Monday, 28 September 2020

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