Dr. Birgit Quack GEOMAR Helmholtz Centre for Ocean Research Kiel Marine Biogeochemistry Chemical Oceanography Düsternbrooker Weg 20 24105 Kiel, Germany

Tel.: +49-431-600-4206 Fax.:+49-431-600-134201 email: bquack@geomar.de



Short Cruise Report RV SONNE, cruise SO287

Las Palmas, Spain – Guayaquil, Ecuador 11.12.2021 – 11.01.2022

Chief Scientist: Birgit Quack

Captain: Tilo Birnbaum

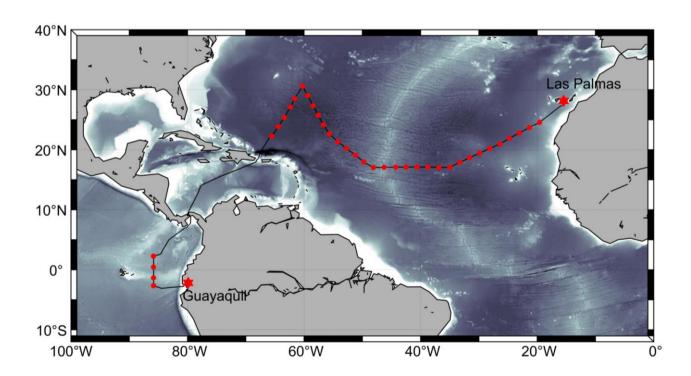


Fig. 1: Cruise track (black line) and stations (red dots) of RV SONNE cruise SO287.

Objectives

The RV SONNE cruise SO287 from Las Palmas, Spain (departure: 11.12.2021) to Guayaquil, Ecuador (arrival: 11.01.2022) is directly related to the international collaborative project CONNECT of GEOMAR in cooperation with Hereon and the University of Bremen, supported by the German Federal Ministry of Education and Research (BMBF) between October 15 2021 and January 15 2024. The research expedition was conducted to decipher the coupling of biogeochemical and ecological processes and their influence on atmospheric chemistry along the transport pathway of water from the upwelling zones off Africa into the Sargasso Sea and further to the Caribbean and the equatorial Pacific. Nutrient-rich water rises from the deep and promotes the growth of plant and animal microorganisms, and fish at the ocean surface off West Africa. The North Equatorial Current water carries the water from the upwelling, which contains large amounts of organic material across the Atlantic to the Caribbean, supporting bacterial activity along the way. But how the nutritious remnants of algae and other substances are processed on their long journey, biochemically transformed, decomposed into nutrients and respired to carbon dioxide, has so far only been partially investigated.

Air, seawater and particles were sampled in order to provide new details about the large cycles of carbon and nitrogen, but also of many other elements such as oxygen, iodine, bromine and sulfur. Inorganic and organic bromine and iodine compounds are generally emitted naturally from the ocean into the atmosphere, promote cloud formation and affect climate, and some even reach the stratosphere where they contribute to ozone depletion. We measured how much of these compounds are released from the ocean, and at what locations and how they are transformed in the ocean and in the atmosphere. Sargassum algae, which have become a nuisance on beaches in the western and eastern Atlantic, support life and contribute to carbon cycling in the middle of the Atlantic, the Sargasso Sea and in the Caribbean, while their contribution to halogen cycling and marine bromine and iodine emissions was previously unknown. We investigated the influence of various natural parameters such as temperature and solar radiation on the biogeochemical transformation processes in order to understand the influence of climate change on these processes in incubation experiments with seawater and algae. We investigated how anthropogenic signals such as shipping traffic influence the nitrogen and sulphur cycle in the ocean, as well as the impact of nitrogen oxides from ship exhaust and sulphurous, acidic and dirty water from purification systems on organisms and biochemical processes. Plastic debris was sampled from the surface waters to investigate its contribution to global biogeochemical transformation processes. The working hypotheses of the research program were:

- Bioavailability of dissolved organic carbon in surface waters decreases along the productivity gradient and transport pathway from the Eastern to the Western Tropical North Atlantic.
- Nutrient gradients from East to West constrain the microbial utilization of organic mattercontributing to an accumulation of C-rich organic matter due to a) limited mineralization and b) enhanced exudation- also leading to gel-like particles accumulation in the western tropical North Atlantic and Sargasso Sea.
- Tropospheric and stratospheric ozone are strongly impacted by biogeochemical and ecological processes occurring around and in the NA gyre system related to marine iodine and bromine cycles.
- The long-range transport of natural and anthropogenic organic matter in water and of gases and aerosols in the air impact carbon-export, biogeochemical cycles in the water column, and the release of gases and particles from the ocean significantly.

The data and samples obtained specifically target carbon, nutrient and halogen cycling, the composition of phytoplankton, bacteria, the transport and sequestration of macro algae and the airsea exchange processes of climate relevant gases and aerosols. The influence of ecological and transport processes, as well as anthropogenic impacts on the North Atlantic gyre system, specifically in the Sargasso Sea and the influence of ship emissions throughout the Atlantic towards the west and into the Pacific will be investigated with the data.

Narrative

With SO287-CONNECT, the research vessel SONNE set sail again for one of its most important areas of operation - the Pacific Ocean - after a long forced break due to the outbreak of the Corona pandemic, during which the vessel operated in the Atlantic Ocean and Mediterranean Sea, only. Short-term visa and permissions, collaborative activities and mutual agreed rapid decisions between many actors enabled the successful conduct of SO287-CONNECT. The scientific team arrived to Las Palmas on the 8th and 9th of December. After embarkation on the 10th, an international team of 39 scientists from 11 different nations together with the 30 crewmembers of the research vessel SONNE set sail on the 11th of December 2021 to cross the Atlantic Ocean over Christmas. We took thousands of samples, made as many measurements and obtained millions of data points with continuous instrumentation in order to understand how marine biogeochemical processes during the transport from Africa across the Atlantic to the Sargasso Sea and all the way to the Caribbean are linked to climate change and other anthropogenic influences, such as ship traffic and plastic pollution. All arriving personnel were at least vaccinated twice against Covid-19. As all our PCR tests were negative, we were allowed to embark on the voyage and wore masks for a week until we were absolutely sure that no Corona virus made it on board. We enjoyed the luxury of the virus free expedition, which gave us the opportunity to explore very fundamental questions in detail.

After the departure from Las Palmas on the 11th of December 2021, the underway program of SO287-CONNECT started immediately after 12nm with continuous underway measurements of temperature (T), salinity (S), and fluorescence. As soon as the equipment was set up, we started with the measurements of carbon cycle parameters (Dissolved and particulate organic carbon, nitrogen, phosphorus, carbohydrates, amino acids, gel-particles, lipids, cell abundance of bacteria, pico- and nano plankton, viruses, bacterial biomass production, fluorescence, primary production, enzyme activity), community characterization with 16S rRNA, 18S rRNA-sampling, phytoplankton fixation, chlorophyll and other pigments and flow cytometry from depth profiles. Trace gases (N₂O, CH₄, NO, halocarbons, DMS, oxygen) as well as nutrients, nitrate isotopes, iodide, iodate, total iodine, and ozone were sampled from the surface waters. Continuously NOx, SO2, CO, black carbon concentrations, and NO2, HCHO and SO2 integrated columns, as well as the ozone deposition velocity, water vapor and aerosol depth were measured in the atmosphere. The structure of the atmosphere was determined during 40 radiosonde and 7 ozone sonde launches, determining temperature, humidity, pressure, position and ozone up to 30 km height. Air samples were taken every 6 hours in stainless steel canisters, whereas aerosols were sampled on filters for 24 hours. The sunlight intensity as well as other optical properties such as photosynthetic active radiation (PAR), surface reflectance, the absorption coefficient of CDOM and particles (spectrally) were measured. The intensity and direction of ocean currents was measured with acoustic methods (ADCP 38 and 75 kHz) and the backscattered acoustic signal from marine organisms was determined with the echosounder EK60 (18, 38, 120, 200 kHz). Finally, plastic debris was sampled from the surface water regularly with a Neuston catamaran.

The regular routine of the expedition started on December 12 with the first station at noon soon after we reached international waters. We carried out 32 stations in the Atlantic, of which we carried out one around noon and one in the middle of the night in order to have a regular station distance during transit and also to be able to distinguish the light-dependent processes in the seawater. At noon, the ships' CTD was deployed down to 1000 m and an additional optical biological CTD from the project partner Hereon, equipped with a FastOcean ADP (Adapted Plus Dark) for photosynthetic parameters down to 100 m. Right at the beginning of the cruise, a sampling pump for in-situ sampling fell dry, burned out, and has since been unable to be used, putting strain on the water budget. As the water demand for sampling was very high, we included another cast down to 200 m of the ships CTD on every station. The working boat of RV SONNE was deployed to collect water from the sea surface microlayer with a Garret screen where the wind

and wave situation made it possible. This was not the case in the first week of operation as the swell from northerly storms was too high. But on every noon station the sea surface microlayer was at least sampled from the ships deck, which was not possible during two stormy occasions. The Neuston Catamaran was deployed at every noon station, and several times during transit in the exclusive economic zones of the Caribbean islands along the ships route. Additionally, sun observations and special turns of RV SONNE to avoid air-and aerosol sample contamination were included on stations, which also allowed the start of the radiosondes at noon and at night. Four ozone sondes were started in the Atlantic after every third day. On our night stations across the Mid-Atlantic Ridge at the end of the first week of the cruise, the ocean floor was mapped before deployment of the CTD down to the bottom. The first Sargassum patches were encountered on 23rd of December (second week) on our way to the northern most station and the first samples of different morphotypes of this floating algae were collected from the boat and incubation work started. Besides the ongoing research program, we celebrated Christmas on December 24 and 25 with good food, singing, poems, presents and charades organized by the 11 nationalities on board. The last stations in the Atlantic worked again smoothly and on December 29, we entered the first of six different exclusive economic zones (EEZ) in the Caribbean, starting with Puerto Rico.

In the Caribbean EEZs of Puerto Rico (29.12.), the Dominican Republic (29.-31.12.), Haiti (31.12.), Jamaica (31.12.-01.01.22), Columbia (01.-02.01.), Panama (02.-06.01.) and the Pacific side of Columbia (06.01.), the three-hourly-underway-sampling of trace gases and nutrients continued, as well as the acoustic identification of currents and organisms. Additionally, the Neuston Catamaran was deployed for the collection of plastic debris. As occasionally massive patches of Sargassum were encountered, the collection of the algae, stemming from the equatorial regions of the western Atlantic, was possible with the Catamaran and incubations continued. We could underline the international character of the cruise and short relaxations to the round-the-clock work on the expedition by toasting to the New Year for five times, starting with the Asian participants at 12 o'clock noon –ships time- on December 31 2021.

During the cruise through the Caribbean Sea the incubations in the five incubators placed on the stern to perform nitrogen, halogen, sulfur, and volatile organic compound cycling incubation experiments where intensified. Turnover rate and trace gas production measurements were performed, while the influence of natural factors such as light and temperature and of anthropogenic stressors such as sulfuric waste water on the marine biogeochemical processes was investigated to understand potential coupling and feedback mechanisms between these processes. The incubations of Sargassum, sampled in the Sargasso Sea and the Caribbean, continued to identify its contribution to halogen cycles and the marine carbon budget. The data acquisition of the continuous measurements and regular sampling intervals were interrupted in the Panama Canal from January 33 2022, 10 am to January 5 2022, 2 am UTC. After passing through the Panama Canal, which was an impressive experience for all on board RV SONNE and doing four stations in the international waters of the tropical Pacific at 85.5 W, where we crossed the equator on January 7 2022 at 17:07 local time (22:07 UTC). We reached our destination port (the Ecuadorian city of Guayaquil) well protected from the navy after the pilot station on January 10, 2022 in the afternoon, where PCR-testing and container packing was due again.

Acknowledgements

Our sincere thanks goes to many people who supported the success of SO287-CONNECT in many ways. The expedition was created on short-notice and needed rapid actions, flexibility and indomitable endurance of all involved to make the cruise possible and successful under these exceptional COVID-19 conditions. Captain Tilo Birnbaum and his crew are honored for their everlasting support during the cruise and some last-minute rescues, which helped to avoid failures and delays. Marcel Deeke, who represented the generous and reliable shipping company Briese on board, is memorized for his outstanding support to enable the stay of our Senegalese researcher for the entire cruise. Special thanks to the German Research Fleet Coordination Centre at the Universität Hamburg (LDF) for their general support and especially for their tireless and persistent efforts in successfully obtaining all seven diplomatic clearances from the Ministries of Foreign Affairs of Spain, Puerto Rico, the Dominican Republic, Haiti, Jamaica, Columbia and Panama to conduct research in the economic exclusive zones of these countries. A great thank you to the employees in the German consulates of these countries, including Washington, who were involved in the Puerto Rico notification and to the German Ministry of Foreign Affairs. A great thank you also to the authorities in the respective countries who were involved in issuing the permissions. The German Federal Ministry of Education and Research (BMBF), the Review Panel German Research Vessels (GPF) and the 'Projektträger Jülich' at the Jülich Research Centre GmbH (PtJ) put a lot of effort in reviewing and promoting the different proposals for SO287-CONNECT. A special thanks also to the administrative and technical personnel of GEOMAR, who reacted rapidly on many different requests, related to funding, purchase of equipment, traveling, legislation and logistics. Thanks to GEOMAR for supporting the immediate necessities and over hours for the technical personnel on board via the ships fond. Appreciation and recognition also to the young scientific crew on board, of whom a guarter have been on a research vessel for the first time, while they worked very hard to achieve the goals of the expedition. While logistical problems were solved frequently from many involved, e.g. LPL Projects + Logistics GmbH, our special thanks goes to Eric Achterberg and his crew of SO289, who delayed their departure and packed hundreds of kilos of frozen samples, which then luckily reached the storage rooms in our home labs, where they are now waiting for analysis.

Participant list

				T
1	Quack	Birgit, PhD	Chief scientist/Halocarbons	GEOMAR
2	Auganæs	Sigrid Marie	Masterstudent/Ozone sonding	University of Oslo
3	Boehme	Wanja	Masterstudent/Microphytoplankton, 16S	GEOMAR
4	Boesch	Tim, PhD	Scientist/Atmospheric pollution from	Universität Bremen,
5	Brockmann	Inga	Student/ DMS, DMSP, DMSO,	GEOMAR
6	Brown	Lucy	PhD-student/Ozone uptake coefficients	University of York, GB
7	Burmester	Henning	Ing/Optical instrumentation	Hereon
8	da Costa dos	Jesus	Scientist/CTD/ ADCP-ocean currents	ARDITI
9	de Góis	Cláudio	Scientist/CTD/ SSH-Eddies	ARDITI
10	Devresse	Quentin	PhD-student/Microbial respiration	GEOMAR
11	Diogoul	Ndague,	Scientist/Echsounding of the water	IRD-Senegal
12	Feil	Hendrik	Student/ GC/MS of halocarbons	GEOMAR
13	Golde	Sandra	Tech/ Bacterial production, Enzyme	GEOMAR
14	Hepach	Helmke,	Scientist/ FastOcean APD, Lipids,	GEOMAR
15	Heymann	Kerstin	Tech/Pigments	Hereon
16	Hieronymi	Martin, PhD	Scientist/Surface reflectance	Hereon
17	Ingeniero	Riel	PhD-student/NO-production	GEOMAR
18	Karnatz	Josefine	Masterstudent/ Halocarbons and carbon	GEOMAR
19			from Sargassum	
19	Kluever	Tania	Tech/Primary production, Enzyme rates	GEOMAR
20	Latsch	Miriam	Scientist/Atmospheric pollution	Universität Bremen
21	Loades	David	Scientist/Ozone air-sea flux, deposition	University of York, GB
22	Mickenbecker	Julia	Student/ GC/MS of halocarbons	GEOMAR
23	Mueller	Tobias	Masterstudent/TEP, CSP	GEOMAR
24	Offin	Alice	PhD-student/ lodine from ocean and	University of
			Sargassum	Leicester, GB
25	Potin	Philippe,	Scientist/ Sargassum incubations	CNRS
26	Qelaj	Kastriot	Tech/nutrients	GEOMAR
27	Roa	Jon	Tech/UVP, DOC + TDN, DAA, DC, DOP	GEOMAR
28	Rosa	Alexandra	Scientist/CTD	ARDITI
29	Röttgers	Rüdiger,	Scientist/Absorptionspectroscopy	Hereon
30	Röttgers	Sünje	High-School student/Aerosol and air	GEOMAR
31	Röttgers	Lucie	Student/ Aerosol and air sampling	GEOMAR
32	Schartau	Markus, PhD	Scientist/ Bio. part. silica, (POC, PN)	GEOMAR
33	Scheidemann	Lindsay	PhD-student/ Plastic marine debris,	GEOMAR
34	Schulz	Gesa	PhD-student/ Nitrous oxide and	Hereon
35	Sulaiman	Hanif	Student/ 15NO ₃ -, 15N ₂ O, CH ₄ , N ₂ O	GEOMAR
36	Weddell	Katherine	PhD-student/ POM, fatty acids	University of York, GB
37	Wunderlich	Greta	Student/ DMS, DMSP, DMSO, ship	GEOMAR
38	Xu	Peihang,	Scientist/ Microbial Community, carbon	University of Southern
		PhD	fixation, flow cytometry	Denmark
39	Zehender	Isabella	Student/ Dissolved oxygen	GEOMAR

- ARDITI: Regional Agency for the Development of Research, Technology and Innovation of Madeira, Funchal, Portugal
- CNRS: Centre national de la recherche scientifique, Station Biologique de Roscoff, France
- GEOMAR Helmholtz-Centre for Ocean Research Kiel, Germany
- Hereon: Helmholtz-Zentrum Hereon, Geesthacht, Germany
- IRD: Institut de recherche pour le développement Senegal, Dakar, Senegal

Stationlist

- Hereon-CTD: A 12-position water sampler frame with eight 9L-sampling bottles, a CTD (equipped with oxygen, chlorophyll fluorescence and turbidity sensors), several backscatter sensor (2x Eco-VSF and a HydroScat-6), an AC-S attenuation-absorption meter, a LISST-VSF scattering meter and a PAR irradiance sensor
- CTD: A 24 bottle rosette-sampler, with CTD, SBE-911, and sensors for temperature, pressure, conductivity, salinity, density, turbidity, dissolved oxygen, colored dissolved organic matter (CDOM), fluorescence ECO-AFL (chlorophyll-a), fluorescence wet star and irradiance\PAR
- Radiosonde: GRAW-DFM-17 Radiosonde, Sensors: temperature, humidity, pressure, wind
- Ozone sonde: EnSCi-ECC-2Z-V7 Ozonesonde
- ISP: Insitu pump
- Garretscreen: Collection of sea surface microlayer from stern
- Catamaran: Surface deployment for 20 min, collecting neuston from sea surface
- WBAT (attached to CTD): Wide band scientific echo sounder, SIMRAD-EK80
- Zodiak: The ships working boat was used to deploy the Garretscreen from the sea surface.

Activity No.	Station on position	Date	Gear	Time (UTC)	Latitude	Longitude	Ocean Depth [m]	Deploy ment Depth [m]
SO287_1-1	1	12.12.2021	Hereon-CTD	12:47	24° 33,25′ N	019° 34,17' W		70
SO287_1-2	1	12.12.2021	CTD	09:33	24° 33,21' N	019° 34,19' W		200
SO287_1-3	1	12.12.2021	CTD	10:48	24° 33,25′ N	019° 34,17' W	3352	200
SO287_1-4	1	12.12.2021	Hereon-CTD	12:47	24° 33,25′ N	019° 34,17' W	3352	80
SO287_1-5	1	12.12.2021	Radio sonde	12:59	24° 33,25′ N	019° 34,16' W	3352	
SO287_1-6	1	12.12.2021	Garretscreen	13:00	24° 33,25′ N	019° 34,16' W	3353	
SO287_1-7	1	12.12.2021	CTD (WBAT)	13:33	24° 33,25′ N	019° 34,17' W	3355	1000
SO287_1-8	1	12.12.2021	ISP	14:53	24° 33,24' N	019° 34,16' W	3352	104
SO287_1-9	1	12.12.2021	Catamaran	16:04	24° 33,24' N	019° 34,16' W	3353	
SO287_2-1	2	13.12.2021	CTD	00:30	23° 41,68' N	021° 20,31' W	4411	200
SO287_2-2	2	13.12.2021	CTD	01:08	23° 41,66′ N	021° 20,30' W	4411	4350
SO287_2-3	2	13.12.2021	Radio sonde	01:36	23° 41,65′ N	021° 20,30' W	4410	
SO287_3-1	3	13.12.2021	Garretscreen	12:48	22° 47,71' N	023° 04,35' W	4870	
SO287_3-2	3	13.12.2021	Radio sonde	12:52	22° 47,72' N	023° 04,35' W	4870	
SO287_3-3	3	13.12.2021	Hereon-CTD	13:00	22° 47,72' N	023° 04,35' W	4870	100
SO287_3-4	3	13.12.2021	CTD (WBAT)	13:40	22° 47,72' N	023° 04,35' W	4870	200
SO287_3-5	3	13.12.2021	CTD (WBAT)	14:12	22° 47,72' N	023° 04,35' W	4870	1000
SO287_3-6	3	13.12.2021	Catamaran	15:50	22° 47,71' N	023° 04,34' W	4871	
SO287_4-1	4	14.12.2021	CTD	00:10	21° 54,47' N	024° 45,58' W	5102	200
SO287_4-2	4	14.12.2021	CTD	00:37	21° 54,48' N	024° 45,59' W	5100	5050
SO287_4-3	4	14.12.2021	Radio sonde	00:51	21° 54,48' N	024° 45,59' W	5100	
SO287_5-1	5	14.12.2021	CTD (WBAT)	12:24	20° 57,31' N	026° 23,90' W	5049	200
SO287_5-2	5	14.12.2021	Garretscreen	12:28	20° 57,31' N	026° 23,90' W	5300	
SO287_5-3	5	14.12.2021	Hereon-CTD	13:00	20° 57,32' N	026° 23,91' W	5299	100
SO287_5-4	5	14.12.2021	Radio sonde	13:34	20° 57,32' N	026° 23,90' W	5301	
SO287_5-5	5	14.12.2021	CTD (WBAT)	13:40	20° 57,31' N	026° 23,91' W	5048	1000
SO287_5-6	5	14.12.2021	Catamaran	14:59	20° 57,32' N	026° 23,91' W	5299	
SO287_6-1	6	14.12.2021	CTD	23:38	20° 11,98' N	028° 07,99' W	4954	200
SO287_6-2	6	15.12.2021	CTD	00:12	20° 12,00' N	028° 07,98' W	4955	4900
SO287_6-3	6	15.12.2021	Radio sonde	00:37	20° 12,01' N	028° 07,98' W	4955	
SO287_7-1	7	15.12.2021	Sun observ.	11:21	19° 26,72' N	029° 52,20' W	5071	
SO287_7-2	7	15.12.2021	CTD (WBAT)	11:42	19° 26,70' N	029° 52,20' W	4773	200
SO287_7-3	7	15.12.2021	Garretscreen	11:43	19° 26,70' N	029° 52,20' W	4784	
SO287_7-4	7	15.12.2021	CTD (WBAT)	12:22	19° 26,71' N	029° 52,21' W	4783	1000
SO287_7-5	7	15.12.2021	Ozone sonde	13:08	19° 26,70' N	029° 52,20' W	4789	
SO287_7-6	7	15.12.2021	Hereon-CTD	13:44	19° 26,71' N	029° 52,21' W	4777	100

SO287_7-7	7	15.12.2021	Catamaran	14:26	19° 26,71' N	029° 52,20' W	4786	
SO287_8-1	8	15.12.2021	CTD	22:52	18° 39,95' N	031° 34,92' W	4860	200
SO287_8-2	8	15.12.2021	CTD	23:29	18° 40,01' N	031° 34,85' W	4876	
SO287_8-3	8	15.12.2021	Radio sonde	23:46	18° 39,99' N	031° 34,84' W	4870	
SO287_9-1	9	16.12.2021	Sun observ.	10:48	17° 53,69' N	033° 16,96' W	4987	
SO287_9-2	9	16.12.2021	Zodiac	11:16	17° 53,65' N	033° 16,98' W	4976	
SO287_9-3	9	16.12.2021	CTD (WBAT)	11:22	17° 53,66' N	033° 17,00' W	4981	200
SO287_9-4	9	16.12.2021	CTD (WBAT)	12:01	17° 53,66' N	033° 17,02' W	4983	1000
SO287_9-5	9	16.12.2021	Radio sonde	13:03	17° 53,67' N	033° 17,02' W	5303	1000
SO287_9-6	9	16.12.2021	Zodiac	13:29	17° 53,67' N	033° 17,02' W	4989	
SO287_9-7	9	16.12.2021	Hereon-CTD	13:38	17° 53,67' N	033° 17,02' W	4994	100
SO287_9-8	9	16.12.2021	Catamaran	14:29	17° 53,67' N	033° 17,01' W	4998	100
SO287_9-9	9	16.12.2021	Sun observ.	15:00	17° 54,15' N	033° 15,86' W	5081	
SO287_10-1	10	17.12.2021	CTD	00:13	17° 05,43' N	034° 57,93' W	5429	
SO287_10-1	10	17.12.2021	CTD	00:45	17° 05,44' N	034° 57,94' W	5181	5100
SO287_10-2 SO287_10-3	10	17.12.2021	Radio sonde	01:10	17° 05,43' N	034° 57,93' W	5179	3100
SO287_11-1	11	17.12.2021	Sun observ.	13:02	17° 03,43 N	036° 51,38' W	4760	
SO287_11-1	11	17.12.2021	CTD (WBAT)	13:25	17° 03,49' N	036° 51,81' W	5035	200
SO287_11-3	11	17.12.2021	Garretscreen	13:26	17° 03,49' N	036° 51,81' W	5040	200
SO287_11-3	11	17.12.2021	Hereon-CTD	13:55	17° 03,49' N	036° 51,81' W	5053	100
SO287_11-4 SO287_11-5	11	17.12.2021	Radio sonde	14:32	17° 03,49' N	036° 51,81' W	5046	100
SO287_11-5 SO287_11-6	11	17.12.2021		14:36	17° 03,49' N	036° 51,81' W	5045	1000
	11		CTD (WBAT)		17° 03,49° N	·		1000
SO287_11-7	12	17.12.2021	Catamaran CTD	15:59	·	036° 51,80′ W	5047	200
SO287_12-1		18.12.2021		01:18	17° 06,69' N	038° 43,95' W	5190	200
SO287_12-2	12	18.12.2021	CTD	01:46	17° 06,70' N	038° 43,95' W	5188	5000
SO287_12-3	12	18.12.2021	Radio sonde	02:10	17° 06,68' N	038° 43,95' W	5185	
SO287_13-1	13	18.12.2021	Sun observ.	14:06	17° 07,73' N	040° 36,84' W	5032	
SO287_13-2	13	18.12.2021	Garretscreen	14:28	17° 07,75' N	040° 37,25' W	5222	400
SO287_13-3	13	18.12.2021	Hereon-CTD	14:30	17° 07,75' N	040° 37,24' W	4953	100
SO287_13-4	13	18.12.2021	Ozone sonde	14:42	17° 07,74' N	040° 37,24' W	4946	200
SO287_13-5 SO287 13-6	13 13	18.12.2021 18.12.2021	CTD (WBAT) CTD (WBAT)	15:05 15:35	17° 07,76' N	040° 37,24' W	4952	200 1000
	13			17:24	17° 07,74' N	040° 37,24' W 040° 37,19' W	4952 4971	1000
SO287_13-7		18.12.2021	Catamaran CTD		17° 07,76' N			200
SO287_14-1	14 14	19.12.2021 19.12.2021	CTD	02:35	17° 06,76' N 17° 06,77' N	042° 30,14' W 042° 30,15' W	5555 5562	
SO287_14-2	14	19.12.2021		03:01		042° 30,13′ W	5558	5530
SO287_14-3			Radio sonde	03:24	17° 06,77' N			100
SO287_15-1	15	19.12.2021	Hereon-CTD	14:53	17° 05,84' N 17° 05,82' N	044° 16,04' W 044° 16,03' W	4113	100
SO287_15-2	15	19.12.2021	Radio sonde	15:18 15:33	17° 05,82 N	044° 16,03′ W	4118	200
SO287_15-3	15	19.12.2021	CTD (WBAT)			·	4117	200
SO287_15-4	15	19.12.2021	Garretscreen	15:51	17° 05,83' N	044° 16,04' W	4119 4105	1000
SO287_15-5	15 15	19.12.2021 19.12.2021	CTD (WBAT)	16:01 17:55	17° 05,83' N 17° 05,85' N	044° 16,04' W 044° 15,99' W	4105 4133	1000
SO287_15-6	16		Catamaran CTD	03:33	17° 05,85 N	·	4133	200
SO287_16-1		20.12.2021	CTD		17° 04,51 N	046° 15,86' W 046° 15,86' W	3283	200
SO287_16-2	16 16	20.12.2021	Radio sonde	03:59	17° 04,52 N	046° 15,86' W	3283	3248
SO287_16-3	17	20.12.2021		04:20	17° 04,52 N 17° 01,89' N	048° 06,53' W		
SO287_17-1	17	20.12.2021	Sun observ. CTD (WBAT)	14:29 14:46		,	3284	200
SO287_17-2		20.12.2021			17° 01,82' N	048° 06,87' W	3997	
SO287_17-3	17	20.12.2021	Hereon-CTD	15:37	17° 01,82' N	048° 06,86' W	4064	100
SO287_17-4	17 17	20.12.2021	Radio sonde	15:57	17° 01,83' N	048° 06,86' W	4058	1000
SO287_17-5	17	20.12.2021	CTD (WBAT)	16:19	17° 01,83' N	048° 06,88' W	4073	1000
SO287_17-6		20.12.2021	Garretscreen	16:37	17° 01,83' N	048° 06,86' W	4066	
SO287_17-7	17	20.12.2021	Catamaran	17:46	17° 01,84' N	048° 06,87' W	4053	200
SO287_18-1	18	21.12.2021	CTD	02:43	17° 57,14' N	049° 44,99' W	4062	200
SO287_18-2	18	21.12.2021	CTD	03:09	17° 57,14' N	049° 44,99' W	4591	4400
SO287_18-3	18	21.12.2021	Radio sonde	03:27	17° 57,13′ N	049° 44,98' W	4599	
SO287_19-1	18	21.12.2021	Sun observ.	14:07	19° 05,73' N	051° 11,73' W	4576	000
SO287_19-2	19	21.12.2021	CTD (WBAT)	14:29	19° 06,09' N	051° 12,28' W	4287	200
SO287_19-3	19	21.12.2021	Garretscreen	14:39	19° 06,09' N	051° 12,31' W	4251	

SO287_19-4	19	21.12.2021	Hereon-CTD	15:02	19° 06,10' N	051° 12,31' W	4266	100
SO287_19-5	19	21.12.2021	Ozone sonde	15:33	19° 06,10' N	051° 12,31' W	4304	
SO287_19-6	19	21.12.2021	CTD (WBAT)	15:44	19° 06,09' N	051° 12,31' W	4312	1000
SO287_19-7	19	21.12.2021	Catamaran	17:10	19° 06,10' N	051° 12,30' W	4319	
SO287_20-1	20	22.12.2021	CTD	01:46	20° 13,91' N	052° 42,75' W	4348	200
SO287_20-2	20	22.12.2021	CTD	02:23	20° 13,92' N	052° 42,70' W	4943	4800
SO287_20-3	20	22.12.2021	Radio sonde	02:44	20° 13,92' N	052° 42,70' W	4986	1000
SO287_21-1	21	22.12.2021	Sun observ.	13:28	21° 20,82' N	054° 12,60' W	4996	
SO287_21-2	21	22.12.2021	Zodiac	13:28	21° 20,82' N	054° 12,60' W	5035	
SO287_21-3	21	22.12.2021	CTD (WBAT)	13:50	21° 20,98' N	054° 12,76' W	5047	200
SO287_21-4	21	22.12.2021	Heron-CTD	14:22	21° 20,98' N	054° 12,76' W	5057	100
SO287_21-5	21	22.12.2021	Radio sonde	14:52	21° 20,98' N	054° 12,76' W	5069	
SO287_21-6	21	22.12.2021	CTD (WBAT)	15:05	21° 20,97' N	054° 12,76' W	5060	1000
SO287_21-7	21	22.12.2021	Catamaran	16:51	21° 20,87' N	054° 12,60' W	5061	1000
SO287_22-1	22	23.12.2021	CTD	01:30	22° 37,69' N	055° 38,39' W	5048	200
SO287_22-2	22	23.12.2021	CTD	02:02	22° 37,69' N	055° 38,39' W	6238	5910
SO287_22-3	22	23.12.2021	Radio sonde	02:18	22° 37,69' N	055° 38,39' W	6008	0010
SO287_23-1	23	23.12.2021	Sun observ.	15:00	24° 09,10' N	056° 40,12' W	0000	
SO287_23-2	23	23.12.2021	Zodiac	15:08	24° 09,13' N	056° 40,16' W	5757	
SO287_23-3	23	23.12.2021	CTD (WBAT)	15:25	24° 09,13' N	056° 40,15' W	5776	200
SO287_23-4	23	23.12.2021	Hereon-CTD	15:47	24° 09,13' N	056° 40,14' W	5765	100
SO287_23-5	23	23.12.2021	Radio sonde	16:03	24° 09,13' N	056° 40,14' W	5753	100
SO287_23-6	23	23.12.2021	CTD (WBAT)	16:27	24° 09,13′ N	056° 40,14' W	5768	
	23		` ,	18:07	24° 09,13 N	056° 40,13' W	5763	
SO287_23-7	24	23.12.2021	Catamaran CTD	02:30	25° 44,37' N		6307	200
SO287_24-1	24	24.12.2021	CTD	02:54	25° 44,36' N	057° 34,73' W		200
SO287_24-2		24.12.2021				057° 34,72' W	6300	FOFO
SO287_24-3	24	24.12.2021	Radio sonde	03:32	25° 44,36' N	057° 34,73' W	6300	5950
SO287_25-1	25	24.12.2021	Sun observ.	14:45	27° 20,10' N	058° 27,23' W	6479	200
SO287_25-2	25	24.12.2021	CTD (WBAT)	15:06	27° 20,19' N	058° 27,19' W	6484	200
SO287_25-3	25	24.12.2021	Garretscreen	15:13	27° 20,19' N	058° 27,20' W	6487	100
SO287_25-4	25	24.12.2021	Hereon-CTD	15:30	27° 20,20' N	058° 27,20' W	6485	100
SO287_25-5	25	24.12.2021	CTD (WBAT)	16:09	27° 20,20' N	058° 27,19' W	6484	1000
SO287_25-6	25 25	24.12.2021	Radio sonde	16:11 17:43	27° 20,20' N	058° 27,19' W	6485	
SO287_25-7	26	24.12.2021 25.12.2021	Catamaran CTD		27° 20,20' N 29° 01,44' N	058° 27,22' W	6488	200
SO287_26-1	26	25.12.2021	CTD	02:39		059° 23,02' W	6483	200 5450
SO287_26-2				03:01	29° 01,51' N	059° 23,06' W 059° 23,06' W	6493	3430
SO287_26-3	26	25.12.2021	Radio sonde	03:27	29° 01,51' N	,	5531	
SO287_27-1	27	25.12.2021	Sun observ.	15:06	30° 34,80′ N	060° 15,39' W	5536	200
SO287_27-2	27	25.12.2021	CTD (WBAT)	15:26	30° 35,03′ N	060° 15,51' W	5549	200
SO287_27-3	27	25.12.2021	Garretscreen	15:43	30° 35,03′ N	060° 15,51' W	5538	400
SO287_27-4	27	25.12.2021	Hereon-CTD	15:49	30° 35,04' N 30° 35,03' N	060° 15,51' W	5492	100
SO287_27-5	27	25.12.2021	CTD (WBAT)	16:30	·	060° 15,50' W	5506	1000
SO287_27-6	27	25.12.2021	Ozone sonde	16:44	30° 35,03′ N	060° 15,51' W	5518	
SO287_27-7	27	25.12.2021	Catamaran	17:59	30° 35,03′ N	060° 15,50' W	5513	200
SO287_28-1	28	26.12.2021	CTD	12:40	28° 31,12' N	061° 36,38' W	5512	200
SO287_28-2	28	26.12.2021	CTD	13:28	28° 31,12' N	061° 36,37' W	5482	1000
SO287_28-3	28	26.12.2021	Garretscreen	13:38	28° 31,12' N	061° 36,39' W	5371	100
SO287_28-4	28	26.12.2021	Hereon-CTD	15:09	28° 31,13' N	061° 36,38' W	5372	100
SO287_28-5	28	26.12.2021	Radio sonde	15:13	28° 31,13' N	061° 36,38' W	5382	
SO287_28-6	28	26.12.2021	Catamaran	15:47	28° 31,12' N	061° 36,38' W	5371	000
SO287_29-1	29	27.12.2021	CTD	00:00	27° 06,85' N	062° 20,77' W	5371	200
SO287_29-2	29	27.12.2021	CTD	00:39	27° 06,86' N	062° 20,77' W	5368	5750
SO287_29-3	29	27.12.2021	Radio sonde	00:55	27° 06,85' N	062° 20,78' W	6090	
SO287_30-1	30	27.12.2021	Sun observ.	14:48	25° 23,30' N	063° 23,08' W	5836	655
SO287_30-2	30	27.12.2021	CTD (WBAT)	15:02	25° 23,30' N	063° 23,08' W	5836	200
SO287_30-3	30	27.12.2021	Garretscreen	15:10	25° 23,30' N	063° 23,08' W	5714	
SO287_30-4	30	27.12.2021	Hereon-CTD	15:27	25° 23,31' N	063° 23,08' W	5718	100
SO287_30-5	30	27.12.2021	Radio sonde	15:50	25° 23,31' N	063° 23,08' W	5738	

SO287_31-2 30 27.12.2021 Catamaran 17:35 25°23.30 N 063°23.08 W 5714 570287_31-2 31 28.12.2021 CTD 02.28 23°52.37 N 064°24.28 W 5713 200 SO287_31-3 31 28.12.2021 CTD 02.52 23°52.37 N 064°24.28 W 5717 5370 SO287_31-3 32 28.12.2021 CTD 02.52 23°52.37 N 064°24.28 W 5717 5370 SO287_31-3 32 28.12.2021 CTD observ. 15:00 22°14.60 N 065°32.40 W 5445 SO287_32-2 32 28.12.2021 CD(WBAT) 15:12 22°14.60 N 065°32.40 W 5445 SO287_32-3 32 28.12.2021 CD(WBAT) 15:12 22°14.60 N 065°32.40 W 5445 SO287_32-3 32 28.12.2021 CD(WBAT) 15:12 22°14.60 N 065°32.40 W 5811 1000 SO287_32-4 32 28.12.2021 CD(WBAT) 15:12 22°14.60 N 065°32.40 W 5811 1000 SO287_32-6 32 28.12.2021 Radio sonde 16:48 22°14.60 N 065°32.40 W 5811 1000 SO287_32-6 32 28.12.2021 Catamaran 17:51 22°14.60 N 065°32.40 W 5811 1000 SO287_33-1 transit 29.12.2021 Catamaran 17:51 22°14.60 N 065°32.40 W 6067 SO287_33-1 transit 29.12.2021 Catamaran 17:51 22°14.60 N 065°32.40 W 6067 SO287_33-1 transit 30.12.2021 Catamaran 17:51 22°14.60 N 065°32.40 W 6067 SO287_33-1 transit 30.12.2021 Catamaran 17:14 17°5.95 N 068°2.162 W SO287_33-1 transit 30.12.2021 Catamaran 12:00 16°38.60 N 066°32.40 W SO287_33-1 transit 30.12.2021 Catamaran 12:00 16°38.60 N 07°4.45 N 07°4.80 N SO287_34-1 transit 30.12.2021 Catamaran 12:00 16°38.60 N 07°19.75 N SO287_34-1 transit 30.12.2021 Catamaran 19:45 16°38.60 N 07°19.75 N SO287_40-1 transit 30.12.2021 Catamaran 19:45 16°38.60 N 07°19.75 N SO287_40-1 transit 30.12.2021 Catamaran 19:45 16°38.60 N 07°19.75 N SO287_40 N SO287_40-1 transit 01.01.2022 Radio sonde 16:59 16°38.60 N 07°19.75 N 07°19.75 N SO287_40-1 transit 01.01.2022 Radio sonde 10.20 16°38.60 N 07°19.75 N 07°19.75 N 07°19.75 N	SO287_30-6	30	27.12.2021	CTD (WBAT)	16:06	25° 23,31' N	063° 23,09' W	5718	1000
SO287_31-1 31		30		` '		·			
SO287 31-2 31 28.12.2021 CTD C2-52 23°52.37 N O64°24.28 W 5717 5370 5370 5370 5371 320 32 28.12.2021 Sun observ. 15:00 22°14.60°N O65°32.42 W 5465 50287 32-2 32 28.12.2021 Codiac 15:07 22°14.60°N O65°32.42 W 5465 50287 32-2 32 28.12.2021 CD(WBAT) 15:12 22°14.60°N O65°32.40°W 5415 2008 28.12.2021 CD(WBAT) 15:12 22°14.60°N O65°32.40°W 5415 2008 28.12.2021 CD(WBAT) 15:12 22°14.60°N O65°32.40°W 5411 100 20287 32-2 32 28.12.2021 CD(WBAT) 15:45 22°14.60°N O65°32.40°W 5414 100 50287 32-6 32 28.12.2021 CD(WBAT) 61:64 22°14.60°N O65°32.40°W 5414 100 50287 32-6 32 28.12.2021 Calamaran 12:00 16*47.01°N O65°32.40°W 5414 100 50287 32-6 32 28.12.2021 Calamaran 12:00 18*47.01°N O65°32.40°W 5604 50287 33-1 Iransit 29.12.2021 Calamaran 12:00 18*47.01°N O65°32.40°W 5604 50287 33-1 Iransit 29.12.2021 Calamaran 12:00 18*47.01°N O65°32.40°W 5604 50287 33-1 Iransit 30.12.2021 Calamaran 12:00 18*47.01°N O65°32.40°W 5604 50287 33-1 Iransit 30.12.2021 Calamaran 12:00 18*47.01°N O65°32.40°W 5604 50287 33-1 Iransit 30.12.2021 Calamaran 12:00 18*47.01°N O65°32.40°W 5604 50287 33-1 Iransit 30.12.2021 Calamaran 12:00 18*47.01°N O65°32.40°W 50287 33-1 Iransit 30.12.2021 Calamaran 12:00 16°58.30°N O77°44.50°W 50287 33-1 Iransit 30.12.2021 Calamaran 19:45 16°38.60°N O77°37.17°W 50287 33-1 Iransit 31.12.2021 Calamaran 19:45 16°38.60°N O77°37.17°W 50287 33-1 Iransit 31.12.2021 Calamaran 19:45 16°38.60°N O77°37.17°W 50287 34-1 Iransit 01.01.2022 Radio sonde 05:50 15°38.60°N O74°50.52°W 50287 34-1 Iransit 01.01.2022 Radio sonde 05:10 17:40 078°50.40°W 078°50.50°W 50287 53-1 Iransit 00.01.2022 Radio sonde 05:10 078°50.40°W 078°50.40°W 05:10 078°50.						·			200
SO287_31-3 31 28.12.2021 Sun observ 15:00 22° 14.60° N 068° 32.40° W 5445							·		
SO287_32-1 32							·		3370
SO287_32-2 32 28.12.2021 Zodiac 15.07 22°14.60°N 065°32.40°W 5445 200 SO287_32-4 32 28.12.2021 Hereon-CTD 15.45 22°14.60°N 065°32.40°W 5811 200 SO287_32-6 32 28.12.2021 Hereon-CTD 15.45 22°14.60°N 065°32.40°W 5814 100 SO287_32-6 32 28.12.2021 All Reon-CTD 15.45 22°14.60°N 065°32.40°W 5811 1000 SO287_32-6 32 28.12.2021 CTD (WBAT) 16.26 22°14.60°N 065°32.40°W 5811 1000 SO287_32-6 32 28.12.2021 Catamaran 17.51 22°14.60°N 065°32.40°W 6067 SO287_33-1 transit 29.12.2021 Catamaran 17.51 22°14.60°N 065°32.40°W 6067 SO287_33-1 transit 29.12.2021 Catamaran 17.51 22°14.60°N 065°32.40°W 6067 SO287_35-1 transit 29.12.2021 Catamaran 17.51 22°14.60°N 065°32.40°W 6067 SO287_35-1 transit 29.12.2021 Catamaran 19.26 17°51.78°N 068°2.63.80°W SO287_37-1 transit 30.12.2021 Catamaran 19.20 16°58.30°N 068°2.63.80°W SO287_37-1 transit 30.12.2021 Catamaran 19.20 16°58.30°N 070°4.45.80°W SO287_37-1 transit 31.12.2021 Catamaran 19.20 16°58.30°N 071°3.17°W SO287_37-1 transit 31.12.2021 Catamaran 19.20 16°58.30°N 071°3.17°W SO287_41-1 transit 31.12.2021 Catamaran 19.20 16°58.30°N 071°3.27°W SO287_41-1 transit 31.12.2021 Catamaran 19.20 16°58.30°N 071°3.27°W SO287_41-1 transit 01.10.2022 Radio sonde 04.03 16°59.76°N 074°0.92°W SO287_41-1 transit 01.10.2022 Catamaran 19.27 15°3.28°N 074°0.92°W SO287_48-1 transit 01.10.2022 Catamaran 19.27 15°3.28°N 074°0.92°W SO287_48-1 transit 01.10.2022 Catamaran 19.27 15°3.28°N 077°2.03°W SO287_48-1 transit 02.01.2022 Catamaran 19.27 15°3.28°N 077°3.04°W SO287_55-1 transit 05.01.2022 Catamaran 19.27 15°3.28°N 077°3.04°W SO287_55-1 transit 05.01.2022 Catamaran 19.28 10°3.28°N 085°4.99°W 29.09°N SO287_55-1 transit 05.01.2022 Catamaran 19.28 10°0.46°N									
SO287_32-4 32						·			
SO287_32-5 32							·		200
SQ287_32-6 32 28.12.2021 Radio sonde 16.48 22" 14.60" N 0665" 32.40" W 5081 1000									
SOZB7_32-6 32 28.12.2021 Radio sonde 16.48 22° 14.60° N 066° 32.34′ W 6064 SOZB7_33-1 transit 29.12.2021 Catamaran 17.51 22° 14.60° N 066° 32.40′ W 6067 SOZB7_33-1 transit 29.12.2021 Catamaran 17.16 17° 75.78° N 068° 21.62′ W SOZB7_35-1 transit 30.12.2021 Catamaran 19.26 17° 15.78° N 068° 28.38° W SOZB7_37-1 transit 30.12.2021 Catamaran 19.20 16° 38.68° N 070° 44.58° W SOZB7_37-1 transit 30.12.2021 Catamaran 19-25 16° 38.68° N 071° 32.17° W SOZB7_38-1 transit 31.12.2021 Radio sonde 04:03 16° 16°,78° N 072° 27.33° W SOZB7_49-1 transit 31.12.2021 Cone sonde 16:59 15° 39,76° N 074° 05.92° W SOZB7_49-1 transit 01.01.2022 Radio sonde 14:59 15° 32,81° N 074° 05.92° W SOZB7_49-1 transit 01.01.2022									
SO287_33-1 transit 29.12.2021 Catamaran 17.51 22° 14.61'N 065° 32.40'W 6067				` '			·		1000
SO287_34-1 transit 29.12.2021 Catamaran 12.00 18° 47.01' N 667° 44.63' W SO287_34-1 transit 29.12.2021 Catamaran 17.14 17° 53.95' N 068° 21.62' W SO287_35-1 transit 29.12.2021 Catamaran 19.26 17° 51.78' N 068° 21.62' W SO287_36-1 transit 30.12.2021 Catamaran 19.26 17° 51.78' N 068° 28.38' W SO287_37-2 transit 30.12.2021 Catamaran 19.26 16° 58.33' N 070° 44.58' W SO287_37-2 transit 30.12.2021 Catamaran 19.26 16° 38.38' N 070° 31.78' W SO287_38-1 transit 31.12.2021 Radio sonde 04.03 16° 16.78' N 072° 27.33' W SO287_38-1 transit 31.12.2021 Catamaran 19.25 16° 38.93' N 071° 31.78' W SO287_40-1 transit 31.12.2021 Catamaran 19.27 15° 32.81' N 074° 25.27' W SO287_44-1 transit 01.01.2022 Radio sonde 06.23 15° 32.81' N 074° 25.27' W SO287_44-1 transit 01.01.2022 Catamaran 19.27 15° 32.81' N 074° 25.27' W SO287_44-1 transit 01.01.2022 Catamaran 19.27 15° 32.81' N 076° 47.77' W SO287_44-1 transit 01.01.2022 Catamaran 19.27 15° 32.81' N 076° 47.77' W SO287_44-1 transit 01.01.2022 Catamaran 19.27 15° 32.81' N 078° 57.53' W SO287_45-1 transit 02.01.2022 Catamaran 06.12 12° 86.04' N 078° 96.40' W SO287_45-1 transit 02.01.2022 Catamaran 06.12 12° 86.04' N 078° 96.40' W SO287_45-1 transit 05.01.2022 Catamaran 06.01.2024 Catamaran 06° 01.68' N 088° 49.97' W SO287_55-1 transit 05.01.2022 Catamaran 06° 01.68' N 088° 49.97' W 08° 28.75' N				Radio sonde			·	6064	
SO287_35-1 transit 29.12.2021 Catamaran 17:14 17*53.95* N 068*21.62* W SO287_35-1 transit 29.12.2021 Catamaran 19:26 17*51.78* N 068*21.62* W SO287_35-1 transit 30.12.2021 Catamaran 19:20 16*58.33* N 070*44.58* W SO287_37-1 transit 30.12.2021 Catamaran 19:29 16*38.66* N 071*32.17* W SO287_38-1 transit 30.12.2021 Catamaran 19:29 16*38.66* N 071*31.76* W SO287_38-1 transit 31.12.2021 Radio sonde 04:03 16*16.78* N 072*27.33* W SO287_38-1 transit 31.12.2021 Catamaran 11:59 15*54.34* N 073*27.49* W SO287_41-1 transit 31.12.2021 Catamaran 19:27 15*32.81* N 074*23.07* W SO287_41-1 transit 31.12.2021 Catamaran 19:27 15*32.81* N 074*23.07* W SO287_41-1 transit 01.01.2022 Catamaran 19:27 15*32.81* N 074*23.07* W SO287_41-1 transit 01.01.2022 Catamaran 19:27 15*32.81* N 074*23.07* W SO287_41-1 transit 01.01.2022 Catamaran 19:27 15*32.81* N 074*23.07* W SO287_41-1 transit 01.01.2022 Catamaran 19:57 14*28.29* N 076*47.77* W SO287_41-1 transit 02.01.2022 Catamaran 19:57 14*28.29* N 076*47.77* W SO287_41-1 transit 02.01.2022 Catamaran 12:58 12*0.022* N 078*0.53* W SO287_41-1 transit 02.01.2022 Catamaran 12:58 12*0.022* N 078*0.53* W SO287_41-1 transit 02.01.2022 Catamaran 12:58 12*0.022* N 078*0.53* W SO287_51-1 transit 05.01.2022 Catamaran 13:00 06*34.25* N 081*0.09* W SO287_51-1 transit 05.01.2022 Catamaran 13:00 06*34.25* N 081*0.09* W SO287_51-1 transit 05.01.2022 Catamaran 13:00 06*34.25* N 081*0.09* W SO287_51-1 transit 05.01.2022 Catamaran 13:00 06*34.25* N 081*0.09* W SO287_51-1 transit 06.01.2022 Catamaran 13:00 06*34.5* N 082*07.63* W SO287_52-1 transit 06.01.2022 Catamaran 13:00 06*34.5* N 085*0.99* W 200*0.00287_52-1 transit 06.01.2022 Catamaran 13:00 06*34.5* N 085*0.99* W 200*0.00		32		Catamaran			·	6067	
SO287_36-1 transit 29.12.021 Catamaran 19:26 17*51.78* N 068*28.38* N SO287_37-1 transit 30.12.2021 Catamaran 19:20 16*38.86* N O70*44.58* N SO287_37-2 transit 30.12.2021 Catamaran 19:45 16*38.93* N O70*44.58* N SO287_37-2 transit 30.12.2021 Catamaran 19:45 16*38.93* N O71*31.78* N SO287_38-1 transit 31.12.2021 Catamaran 19:45 16*38.93* N O77*27.33* N O77*27.34* N O7	SO287_33-1	transit	29.12.2021	Catamaran	12:00	18° 47,01' N	067° 44,63′ W		
SO287_36-1 transit 30.12_2021 Catamaran 12:00 16° 58,33° N 070° 44,58° W	SO287_34-1	transit	29.12.2021	Catamaran	17:14	17° 53,95' N	068° 21,62' W		
SO287_37-2 transit 30.12.2021 Catamaran 19:29 16° 38,86° N 071° 32,17° W SO287_37-2 transit 30.12.2021 Catamaran 19:29 16° 38,86° N 071° 32,17° W SO287_38-1 transit 31.12.2021 Catamaran 11:59 15° 54,34° N 072° 27,33° W SO287_39-1 transit 31.12.2021 Catamaran 11:59 15° 54,34° N 073° 27,49° W SO287_40-1 transit 31.12.2021 Catamaran 11:59 15° 54,34° N 073° 27,49° W SO287_40-1 transit 31.12.2021 Catamaran 19:27 15° 32,81° N 074° 23,07° W SO287_41-1 transit 01.01.2022 Catamaran 19:27 15° 32,81° N 074° 23,07° W SO287_44-1 transit 01.01.2022 Catamaran 19:27 15° 32,81° N 074° 23,07° W SO287_44-1 transit 01.01.2022 Catamaran 13:57 14° 28,29° N 076° 47,77° W SO287_44-1 transit 01.01.2022 Catamaran 20:24 14° 05,35° N 077° 20,09° W SO287_45-1 transit 02.01.2022 Catamaran 20:24 14° 05,35° N 077° 39,14° W SO287_45-1 transit 02.01.2022 Catamaran 12:58 12° 00,22° N 078° 36,40° W SO287_48-1 transit 02.01.2022 Catamaran 12:58 12° 00,22° N 078° 36,40° W SO287_48-1 transit 02.01.2022 Catamaran 12:58 12° 00,22° N 078° 36,40° W SO287_55-1 transit 05.01.2022 Catamaran 20:19 11° 10.99° N 078° 54,89° W SO287_55-1 transit 05.01.2022 Catamaran 20:19 11° 10.99° N 078° 01,68° W SO287_55-1 transit 05.01.2022 Catamaran 20:25 05° 46,53° N 081° 40,43° W SO287_55-1 transit 06.01.2022 Catamaran 20:25 05° 46,53° N 081° 40,90° W SO287_55-1 transit 06.01.2022 Catamaran 12:57 03° 34,93° N 084° 03,06° W SO287_55-1 transit 06.01.2022 Catamaran 12:57 03° 34,93° N 084° 03,06° W SO287_55-1 transit 06.01.2022 Catamaran 20:25 05° 45,53° N 085° 49,99° W 2901 400 50287_55-3 33 07.01.2022 CTD 02:55 02° 15,80° N 085° 49,99° W 2901 400 50287_55-3 33 07.01.2022 CTD 02:55 02° 15,80° N 085° 49,99° W 2904 2850 0287_55-3 33 07.01.20	SO287_35-1	transit	29.12.2021	Catamaran	19:26	17° 51,78' N	068° 28,38' W		
SO287_37-2 transit	SO287_36-1	transit	30.12.2021	Catamaran	12:00	16° 58,33' N	070° 44,58' W		
SO287_37-2 transit	SO287_37-1	transit	30.12.2021	Catamaran	19:29	16° 38,86' N	071° 32,17' W		
SO287_38-1 transit 31.12_2021 Radio sonde 04.03 16° 16,78′ N 072° 27,33′ W		transit	30.12.2021	Catamaran	19:45				
SO287_40-1 transit 31.12.2021 Catamaran 11:59 15° 54,34′ N 073° 27,49′ W SO287_40-1 transit 31.12.2021 Ozone sonde 16:59 15° 39,6′ N 074° 05,9′ W SO287_40-1 transit 31.12.2021 Catamaran 19:27 15° 32,81′ N 074° 23,0′ W SO287_42-1 transit 01.01.2022 Radio sonde 00:23 15° 17,47′ N 074° 25,0′ W SO287_42-1 transit 01.01.2022 Catamaran 13:57 14° 28,29′ N 076° 47,77′ W SO287_45-1 transit 01.01.2022 Catamaran 13:57 14° 28,29′ N 076° 47,77′ W SO287_45-1 transit 01.01.2022 Catamaran 07:50 14° 13.87′ N 077° 20,0° W SO287_45-1 transit 01.01.2022 Catamaran 07:24 14° 05.35′ N 077° 39,14′ W SO287_45-1 transit 02.01.2022 Catamaran 07:24 14° 05.35′ N 077° 39,14′ W SO287_46-1 transit 02.01.2022 Catamaran 12:58 12° 20.22′ N 078° 36,40′ W SO287_46-1 transit 02.01.2022 Catamaran 12:58 12° 20.22′ N 078° 36,40′ W SO287_48-1 transit 02.01.2022 Catamaran 20:19 11° 10.99′ N 078° 54,92′ W SO287_55-1 transit 05.01.2022 Catamaran 20:19 11° 10.99′ N 079° 01.68′ W SO287_55-1 transit 05.01.2022 Catamaran 20:25 05° 46,53′ N 081° 00,94′ W SO287_55-1 transit 05.01.2022 Catamaran 20:25 05° 46,53′ N 081° 00,94′ W SO287_55-1 transit 06.01.2022 Catamaran 20:25 05° 46,53′ N 082° 07,63′ W SO287_55-1 transit 06.01.2022 Catamaran 20:25 05° 46,53′ N 082° 07,63′ W SO287_55-1 transit 06.01.2022 Catamaran 20:25 05° 46,53′ N 088° 20.09′ W SO287_55-1 transit 06.01.2022 Catamaran 20:25 02° 15,80′ N 088° 49,90′ W 2907 100 20:25 20:25 20:25 20:27 20:									
SO287_41-1 transit 31.12.2021 Ozone sonde 16:59 15° 39,76′ N 074° 05,92′ W SO287_41-1 transit 31.12.2021 Catamaran 19:27 15° 32,81′ N 074° 23,07′ W SO287_42-1 transit 01.01.2022 Catamaran 13:57 14° 28,29′ N 076° 47,77′ W SO287_43-1 transit 01.01.2022 Catamaran 13:57 14° 28,29′ N 076° 47,77′ W SO287_44-1 transit 01.01.2022 Catamaran 20:24 14° 05,35′ N 077° 20,09′ W SO287_46-1 transit 02.01.2022 Catamaran 20:24 14° 05,35′ N 077° 39,14′ W SO287_46-1 transit 02.01.2022 Catamaran 20:24 14° 05,35′ N 078° 36,40′ W SO287_46-1 transit 02.01.2022 Catamaran 20:24 14° 05,35′ N 078° 36,40′ W SO287_48-1 transit 02.01.2022 Catamaran 20:24 14° 05,35′ N 078° 36,40′ W SO287_48-1 transit 02.01.2022 Catamaran 20:19 11° 24,96′ N 078° 07,53′ W SO287_48-1 transit 02.01.2022 Catamaran 20:19 11° 10,99′ N 079° 01,88′ W SO287_50-1 transit 05.01.2022 Catamaran 20:19 11° 10,99′ N 079° 01,88′ W SO287_51-1 transit 05.01.2022 Catamaran 20:25 06° 46,53′ N 088° 46,43′ W SO287_51-1 transit 05.01.2022 Catamaran 20:25 06° 46,53′ N 088° 40,30′ W SO287_56-1 transit 06.01.2022 Catamaran 20:25 06° 46,53′ N 088° 40,89′ W SO287_56-1 transit 06.01.2022 Catamaran 20:25 03° 43,49′ N 084° 20,06′ W SO287_56-1 transit 06.01.2022 Catamaran 20:25 03° 34,93′ N 084° 03,06′ W SO287_56-1 transit 06.01.2022 Catamaran 20:25 02° 52,12′ N 084° 28,90′ W SO287_56-1 transit 06.01.2022 Catamaran 20:25 02° 33,60′ N 088° 49,89′ W 2907 100 SO287_56-1 transit 06.01.2022 Catamaran 20:25 02° 33,60′ N 088° 49,89′ W 2907 100 SO287_56-1 transit 06.01.2022 Catamaran 20:25 02° 33,60′ N 088° 49,89′ W 2907 100 SO287_56-1 transit 06.01.2022 Catamaran 20:25 02° 33,60′ N 088° 49,89′ W 2907 100 SO287_56-1 transit 06.01.2022 CTD 03:54 02° 15,81′ N 088° 49,99′									
SO287_42+1 transit 31.12.2021 Catamaran 19:27 15° 32.81' N 074° 23.07' W SO287_42+1 transit 01.01.2022 Radio sonde 00:23 15° 17,47' N 074° 58.48' W SO287_43-1 transit 01.01.2022 Catamaran 13:57 14° 28.29' N 076° 47,77' W SO287_44-1 transit 01.01.2022 Catamaran 20:24 14° 05,35' N 077° 20.09' W SO287_46-1 transit 02.01.2022 Catamaran 20:24 14° 05,35' N 077° 39.14' W SO287_46-1 transit 02.01.2022 Catamaran 20:24 14° 05,35' N 077° 39.14' W SO287_46-1 transit 02.01.2022 Catamaran 12:58 12° 00,22' N 078° 36.40' W SO287_48-1 transit 02.01.2022 Catamaran 12:58 12° 00,22' N 078° 36.40' W SO287_49-1 transit 02.01.2022 Catamaran 20:19 11° 10,99' N 078° 54,92' W SO287_50-1 transit 05.01.2022 Catamaran 20:19 11° 10,99' N 078° 64,32' W SO287_50-1 transit 05.01.2022 Catamaran 20:25 05° 46,53' N 081° 46,43' W SO287_50-1 transit 05.01.2022 Catamaran 20:25 05° 46,53' N 082° 07,63' W SO287_50-1 transit 06.01.2022 Catamaran 20:25 05° 46,53' N 082° 07,63' W SO287_50-1 transit 06.01.2022 Catamaran 20:25 05° 46,53' N 082° 07,63' W SO287_50-1 transit 06.01.2022 Catamaran 20:25 05° 46,53' N 084° 49,06' W SO287_50-1 transit 06.01.2022 Catamaran 20:25 05° 46,53' N 084° 49,06' W SO287_50-1 transit 06.01.2022 Catamaran 20:25 05° 46,53' N 084° 49,96' W SO287_50-1 transit 06.01.2022 Catamaran 20:25 05° 46,53' N 084° 49,96' W SO287_50-1 transit 06.01.2022 Catamaran 20:25 05° 46,53' N 084° 49,96' W SO287_50-1 transit 06.01.2022 Catamaran 20:25 05° 46,53' N 084° 49,96' W SO287_50-1 33 07.01.2022 CTD 02:59 02° 15,83' N 084° 49,96' W 2999 SO287_50-1 33 07.01.2022 CTD 02:59 02° 15,83' N 084° 49,97' W 2999 SO287_50-1 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 0287_58-2 34 07.01.2022 CTD 04:20 01									
SO287_43-1									
SO287_44-1 transit 01.01.2022 Catamaran 13:57 14° 28,29' N 076° 47,77' W Common stress SO287_44-1 transit 01.01.2022 Radio sonde 17:55 14° 13,87' N 077° 20,09' W Common stress SO287_46-1 transit 02.01.2022 Radio sonde 05:12 12° 58,04' N 078° 36,40' W Common stress SO287_48-1 transit 02.01.2022 Catamaran 12:58 12° 00,22' N 078° 36,40' W Common stress SO287_49-1 transit 02.01.2022 Catamaran 12:58 12° 00,22' N 078° 36,40' W Common stress SO287_50-1 transit 05.01.2022 Catamaran 13:00 06° 34,25' N 081° 00,94' W Common stress SO287_53-1 transit 05.01.2022 Catamaran 12:57 05° 46,53' N 081° 46,43' W Common stress SO287_53-1 transit 06.01.2022 Catamaran 12:57 03° 34,93' N 084° 03,06' W Common stress SO287_53-1 transit 06.01.2022 Ra						·			
SO287_45-1 transit 01.01.2022 Radio sonde 17:55 14° 13,87" N 077° 20,09" W							· ·		
SO287_46-1									
SO287_46-1 transit O2.01.2022 Radio sonde O5:12 12° 58,04' N O78° 07,53' W SO287_47-1 transit O2.01.2022 Catamaran 12:58 12° 00,22' N O78° 36,40' W SO287_48-1 transit O2.01.2022 Catamaran D2:58 11° 24,96' N O78° 54,92' W SO287_49-1 transit O2.01.2022 Catamaran D2:19 D3 D3 D3 D3 D3 D3 D3 D							·		
SO287_47-1 transit 02.01.2022 Catamaran 12:58 12° 00,22' N 078° 36,40' W SO287_48-1 transit 02.01.2022 Ozone sonde 17:55 11° 24,96' N 078° 54,92' W SO287_49-1 Variansit 02.01.2022 Catamaran 20:19 11° 10,99' N 079° 01,68' W SO287_50-1 Variansit 05.01.2022 Catamaran 13:00 06° 34,25' N 081° 00,94' W SO287_51-1 Variansit 05.01.2022 Radio sonde 18:01 06° 01,86' N 081° 46,43' W SO287_52-1 Variansit 05.01.2022 Catamaran 20:25 05° 46,53' N 082° 07,63' W SO287_55-1 Variansit 06.01.2022 Catamaran 12:57 03° 34,93' N 083° 20,09' W SO287_55-1 Variansit 06.01.2022 Radio sonde 17:59 02° 52,12' N 084° 28,90' W SO287_55-1 Variansit 06.01.2022 Catamaran 12:57 03° 34,93' N 084° 44,85' W 2989 SO287_55-1 transit 06.01.2022 Catamaran 20:22 02° 33,60' N 084° 44,85' W 2907 100									
SO287_48-1 transit 02.01.2022 Ozone sonde 17:55 11° 24,96' N 078° 54,92' W SO287_49-1 transit 02.01.2022 Catamaran 20:19 11° 10,99' N 079° 01,68' W SO287_50-1 transit 05.01.2022 Catamaran 13:00 06° 34,25' N 081° 00,94' W SO287_51-1 Transit 05.01.2022 Catamaran 13:00 06° 34,25' N 081° 00,94' W SO287_51-1 VARABAR SARABAR S							·		
SO287_49-1 transit 02.01.2022 Catamaran 20:19 11° 10,99' N 079° 01,68' W SO287_50-1 transit 05.01.2022 Catamaran 13:00 06° 34,25' N 081° 00,94' W SO287_51-1 transit 05.01.2022 Radio sonde 18:01 06° 01,86' N 081° 46,43' W SO287_52-1 transit 05.01.2022 Radio sonde 05:15 06° 01,86' N 082° 07,63' W SO287_53-1 transit 06.01.2022 Radio sonde 05:15 04° 45,88' N 083° 20,09' W SO287_55-1 transit 06.01.2022 Radio sonde 07:59 02° 52,12' N 084° 03,06' W SO287_55-1 transit 06.01.2022 Catamaran 12:57 03° 34,93' N 084° 28,90' W 2989 SO287_55-1 transit 06.01.2022 Catamaran 20:22 02° 33,60' N 084° 48,87' W 2989 SO287_55-1 transit 06.01.2022 Catamaran 20:22 02° 35,60' N 084° 48,87' W 2997 100 SO287_57-2 33 07.01.2022 CTD 02:59 02° 15,83' N							· ·		
SO287_50-1 transit 05.01.2022 Catamaran 13:00 06° 34,25' N 081° 00,94' W SO287_51-1 transit 05.01.2022 Radio sonde 18:01 06° 01,86' N 081° 46,43' W SO287_52-1 transit 05.01.2022 Catamaran 20:25 05° 46,53' N 083° 20,09' W SO287_53-1 transit 06.01.2022 Radio sonde 05:15 04° 45,88' N 083° 20,09' W SO287_54-1 transit 06.01.2022 Radio sonde 17:59 02° 52,12' N 084° 03,06' W SO287_55-1 transit 06.01.2022 Catamaran 12:57 03° 34,93' N 084° 43,85' W 2989 SO287_56-1 transit 06.01.2022 Catamaran 20:22 02° 33,60' N 084° 44,85' W 2989 SO287_57-1 33 07.01.2022 TD 02:35 02° 15,83' N 085° 49,89' W 2907 100 SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,83' N 085° 49,99' W 2904 2850 SO287_58-1									
SO287_51-1 transit 05.01.2022 Radio sonde 18:01 06° 01,86° N 081° 46,43° W SO287_52-1 transit 05.01.2022 Catamaran 20:25 05° 46,53° N 082° 07,63° W SO287_53-1 transit 06.01.2022 Radio sonde 05:15 04° 45,88° N 083° 20,09° W SO287_54-1 transit 06.01.2022 Catamaran 12:57 03° 34,93° N 084° 03,06° W SO287_55-1 transit 06.01.2022 Catamaran 12:57 03° 34,93° N 084° 03,06° W SO287_55-1 transit 06.01.2022 Catamaran 20:22 02° 33,60° N 084° 28,90° W 2989 SO287_56-1 transit 06.01.2022 Catamaran 20:22 02° 15,80° N 084° 48,85° W 2997 100 SO287_57-1 33 07.01.2022 CTD 02:35 02° 15,83° N 085° 49,99° W 2907 100 SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84° N 085° 49,99° W 2904 2850 SO287_58-1 34 07.01.2022 CTD (WBAT				_					
SO287_52-1 transit 05.01.2022 Catamaran 20:25 05° 46,53' N 082° 07,63' W SO287_53-1 transit 06.01.2022 Radio sonde 05:15 04° 45,88' N 083° 20,09' W SO287_54-1 transit 06.01.2022 Catamaran 12:57 03° 34,93' N 084° 03,06' W SO287_54-1 transit 06.01.2022 Radio sonde 17:59 02° 52,12' N 084° 28,90' W 2989 SO287_56-1 transit 06.01.2022 Catamaran 20:22 02° 33,60' N 084° 44,85' W 2989 SO287_57-1 33 07.01.2022 Hereon-CTD 02:35 02° 15,80' N 085° 49,89' W 2907 100 SO287_57-2 33 07.01.2022 CTD 02:59 02° 15,84' N 085° 49,97' W 2901 400 SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 SO287_58-1 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2905 2905									
SO287_53-1 transit 06.01.2022 Radio sonde 05:15 04° 45,88' N 083° 20,09' W SO287_54-1 transit 06.01.2022 Catamaran 12:57 03° 34,93' N 084° 03,06' W SO287_55-1 transit 06.01.2022 Radio sonde 17:59 02° 52,12' N 084° 28,90' W SO287_55-1 Use of transit 06.01.2022 Catamaran 20:22 02° 33,60' N 084° 44,85' W 2989 SO287_57-1 33 07.01.2022 Hereon-CTD 02:35 02° 15,80' N 085° 49,97' W 2907 100 SO287_57-2 33 07.01.2022 CTD 02:59 02° 15,84' N 085° 49,97' W 2901 400 SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 SO287_57-4 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2905 SO287_58-1 34 07.01.2022 CTD (WBAT) 15:58 00° 27,20' N 085° 49,97' W 2802 200 <tr< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>									
SO287_54-1 transit 06.01.2022 Catamaran 12:57 03° 34,93' N 084° 03,06' W SO287_55-1 transit 06.01.2022 Radio sonde 17:59 02° 52,12' N 084° 28,90' W SO287_56-1 transit 06.01.2022 Catamaran 20:22 02° 33,60' N 084° 44,85' W 2989 SO287_57-1 33 07.01.2022 Hereon-CTD 02:35 02° 15,80' N 085° 49,89' W 2907 100 SO287_57-2 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 SO287_57-3 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2904 2850 SO287_58-1 34 07.01.2022 Sun observ. 15:37 00° 27,20' N 085° 49,99' W 2905 SO287_58-2 34 07.01.2022 CTD (WBAT) 15:58 00° 27,21' N 085° 49,97' W 2802 200 SO287_58-3 34 07.01.2022 Carretscreen 16:58 00° 27,21'	SO287_52-1	transit		Catamaran	20:25	05° 46,53' N	082° 07,63' W		
SO287_55-1 transit 06.01.2022 Radio sonde 17:59 02° 52,12' N 084° 28,90' W SO287_56-1 transit 06.01.2022 Catamaran 20:22 02° 33,60' N 084° 44,85' W 2989 SO287_57-1 33 07.01.2022 Hereon-CTD 02:35 02° 15,80' N 085° 49,89' W 2907 100 SO287_57-2 33 07.01.2022 CTD 02:59 02° 15,83' N 085° 49,97' W 2901 400 SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 SO287_57-3 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2905 2905 SO287_58-1 34 07.01.2022 Sun observ. 15:37 00° 27,20' N 085° 49,99' W 2905 2795 2002 2000 27,21' N 085° 49,99' W 2802 200 2795 2802 250 2721' N 085° 49,97' W 2802 200 2721' N 085° 49,97' W 2804	SO287_53-1	transit	06.01.2022	Radio sonde		04° 45,88' N	083° 20,09' W		
SO287_56-1 transit 06.01.2022 Catamaran 20:22 02° 33,60° N 084° 44,85° W 2989 SO287_57-1 33 07.01.2022 Hereon-CTD 02:35 02° 15,80° N 085° 49,89° W 2907 100 SO287_57-2 33 07.01.2022 CTD 02:59 02° 15,83° N 085° 49,97° W 2901 400 SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84° N 085° 49,99° W 2904 2850 SO287_57-4 33 07.01.2022 Radio sonde 04:24 02° 15,84° N 085° 49,99° W 2905 020 02	SO287_54-1	transit	06.01.2022	Catamaran	12:57	03° 34,93' N	084° 03,06' W		
SO287_57-1 33 07.01.2022 Hereon-CTD 02:35 02° 15,80' N 085° 49,89' W 2907 100 SO287_57-2 33 07.01.2022 CTD 02:59 02° 15,83' N 085° 49,97' W 2901 400 SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 SO287_57-4 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2905 SO287_58-1 34 07.01.2022 Sun observ. 15:37 00° 27,20' N 085° 49,99' W 2905 SO287_58-2 34 07.01.2022 CTD (WBAT) 15:58 00° 27,21' N 085° 49,97' W 2802 200 SO287_58-3 34 07.01.2022 Garretscreen 16:58 00° 27,21' N 085° 49,97' W 2804 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,97' W 2802 SO287_58-7 34 07.01.2022 CTD (WBAT) 18:07	SO287_55-1	transit	06.01.2022	Radio sonde	17:59	02° 52,12' N	084° 28,90' W		
SO287_57-2 33 07.01.2022 CTD 02:59 02° 15,83' N 085° 49,97' W 2901 400 SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 SO287_57-4 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2905 SO287_58-1 34 07.01.2022 Sun observ. 15:37 00° 27,20' N 085° 49,96' W 2795 SO287_58-2 34 07.01.2022 CTD (WBAT) 15:58 00° 27,21' N 085° 49,97' W 2802 200 SO287_58-3 34 07.01.2022 Garretscreen 16:58 00° 27,21' N 085° 49,97' W 2804 SO287_58-4 34 07.01.2022 Heron-CTD 17:29 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-5 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,97' W 2802 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07	SO287_56-1	transit	06.01.2022	Catamaran	20:22	02° 33,60′ N	084° 44,85' W	2989	
SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 SO287_57-4 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2905 SO287_58-1 34 07.01.2022 Sun observ. 15:37 00° 27,20' N 085° 49,96' W 2795 SO287_58-2 34 07.01.2022 CTD (WBAT) 15:58 00° 27,21' N 085° 49,97' W 2802 200 SO287_58-3 34 07.01.2022 Garretscreen 16:58 00° 27,21' N 085° 49,97' W 2804 SO287_58-4 34 07.01.2022 Deane Sonde 17:31 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-5 34 07.01.2022 Ozone sonde 17:31 00° 27,21' N 085° 49,97' W 2802 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,99' W 2803 1000 SO287_58-7 34 07.01.2022 Catamaran 19:	SO287_57-1	33	07.01.2022	Hereon-CTD	02:35	02° 15,80' N	085° 49,89' W	2907	100
SO287_57-3 33 07.01.2022 CTD 03:54 02° 15,84' N 085° 49,99' W 2904 2850 SO287_57-4 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2905 SO287_58-1 34 07.01.2022 Sun observ. 15:37 00° 27,20' N 085° 49,96' W 2795 SO287_58-2 34 07.01.2022 CTD (WBAT) 15:58 00° 27,21' N 085° 49,97' W 2802 200 SO287_58-3 34 07.01.2022 Garretscreen 16:58 00° 27,21' N 085° 49,97' W 2804 SO287_58-4 34 07.01.2022 Deane Sonde 17:31 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-5 34 07.01.2022 Ozone sonde 17:31 00° 27,21' N 085° 49,97' W 2802 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,99' W 2803 1000 SO287_58-7 34 07.01.2022 Catamaran 19:	SO287_57-2	33	07.01.2022	CTD	02:59	02° 15,83' N	085° 49,97' W	2901	400
SO287_57-4 33 07.01.2022 Radio sonde 04:24 02° 15,84' N 085° 49,99' W 2905 SO287_58-1 34 07.01.2022 Sun observ. 15:37 00° 27,20' N 085° 49,96' W 2795 SO287_58-2 34 07.01.2022 CTD (WBAT) 15:58 00° 27,21' N 085° 49,97' W 2802 200 SO287_58-3 34 07.01.2022 Garretscreen 16:58 00° 27,21' N 085° 49,97' W 2804 SO287_58-4 34 07.01.2022 Heron-CTD 17:29 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-5 34 07.01.2022 Ozone sonde 17:31 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,97' W 2802 SO287_58-7 34 07.01.2022 Catamaran 19:41 00° 27,19' N 085° 49,99' W 2800 SO287_59-1 35 08.01.2022 CTD 04:00 01° 2	SO287_57-3	33		CTD	03:54		085° 49,99' W	2904	2850
SO287_58-1 34 07.01.2022 Sun observ. 15:37 00° 27,20' N 085° 49,96' W 2795 SO287_58-2 34 07.01.2022 CTD (WBAT) 15:58 00° 27,21' N 085° 49,97' W 2802 200 SO287_58-3 34 07.01.2022 Garretscreen 16:58 00° 27,21' N 085° 49,97' W 2804 SO287_58-4 34 07.01.2022 Heron-CTD 17:29 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-5 34 07.01.2022 Ozone sonde 17:31 00° 27,20' N 085° 49,97' W 2802 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,97' W 2802 SO287_58-7 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,97' W 2802 SO287_59-1 35 08.01.2022 Catamaran 19:41 00° 27,19' N 085° 49,99' W 2800 SO287_59-3 35 08.01.2022 CTD 04:20 01° 20,38' S <		33		Radio sonde	04:24		085° 49,99' W	2905	
SO287_58-2 34 07.01.2022 CTD (WBAT) 15:58 00° 27,21' N 085° 49,97' W 2802 200 SO287_58-3 34 07.01.2022 Garretscreen 16:58 00° 27,21' N 085° 49,97' W 2804 SO287_58-4 34 07.01.2022 Heron-CTD 17:29 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-5 34 07.01.2022 Ozone sonde 17:31 00° 27,20' N 085° 49,97' W 2802 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,97' W 2803 1000 SO287_58-7 34 07.01.2022 Catamaran 19:41 00° 27,19' N 085° 49,99' W 2803 1000 SO287_59-1 35 08.01.2022 Hereon-CTD 04:00 01° 20,38' S 085° 50,00' W 2458 100 SO287_59-2 35 08.01.2022 CTD 04:20 01° 20,38' S 085° 49,99' W 2456 400 SO287_59-3 35 08.01.2022							·		
SO287_58-3 34 07.01.2022 Garretscreen 16:58 00° 27,21' N 085° 49,97' W 2804 SO287_58-4 34 07.01.2022 Heron-CTD 17:29 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-5 34 07.01.2022 Ozone sonde 17:31 00° 27,20' N 085° 49,97' W 2802 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,98' W 2803 1000 SO287_58-7 34 07.01.2022 Catamaran 19:41 00° 27,19' N 085° 49,99' W 2800 SO287_59-1 35 08.01.2022 Hereon-CTD 04:00 01° 20,38' S 085° 50,00' W 2458 100 SO287_59-2 35 08.01.2022 CTD 04:20 01° 20,38' S 085° 49,99' W 2456 400 SO287_59-3 35 08.01.2022 CTD 04:57 01° 20,38' S 085° 49,99' W 2456 2400 SO287_60-1 36 08.01.2022 Radio sonde							·		200
SO287_58-4 34 07.01.2022 Heron-CTD 17:29 00° 27,21' N 085° 49,97' W 2807 100 SO287_58-5 34 07.01.2022 Ozone sonde 17:31 00° 27,20' N 085° 49,97' W 2802 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,98' W 2803 1000 SO287_58-7 34 07.01.2022 Catamaran 19:41 00° 27,19' N 085° 49,99' W 2800 SO287_59-1 35 08.01.2022 Hereon-CTD 04:00 01° 20,38' S 085° 50,00' W 2458 100 SO287_59-2 35 08.01.2022 CTD 04:20 01° 20,38' S 085° 49,99' W 2456 400 SO287_59-3 35 08.01.2022 CTD 04:57 01° 20,38' S 085° 49,99' W 2456 2400 SO287_60-1 36 08.01.2022 Radio sonde 05:41 01° 20,38' S 085° 49,99' W 3156 200 SO287_60-2 36 08.01.2022 Z				,					
SO287_58-5 34 07.01.2022 Ozone sonde 17:31 00° 27,20' N 085° 49,97' W 2802 SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,98' W 2803 1000 SO287_58-7 34 07.01.2022 Catamaran 19:41 00° 27,19' N 085° 49,99' W 2800 SO287_59-1 35 08.01.2022 Hereon-CTD 04:00 01° 20,38' S 085° 50,00' W 2458 100 SO287_59-2 35 08.01.2022 CTD 04:20 01° 20,38' S 085° 49,99' W 2456 400 SO287_59-3 35 08.01.2022 CTD 04:57 01° 20,38' S 085° 50,00' W 2456 2400 SO287_59-4 35 08.01.2022 Radio sonde 05:41 01° 20,38' S 085° 49,99' W 2460 SO287_60-1 36 08.01.2022 CTD (WBAT) 16:14 02° 39,99' S 085° 49,99' W 3156 200 SO287_60-3 36 08.01.2022 Radio sonde							· ·		100
SO287_58-6 34 07.01.2022 CTD (WBAT) 18:07 00° 27,21' N 085° 49,98' W 2803 1000 SO287_58-7 34 07.01.2022 Catamaran 19:41 00° 27,19' N 085° 49,99' W 2800 SO287_59-1 35 08.01.2022 Hereon-CTD 04:00 01° 20,38' S 085° 50,00' W 2458 100 SO287_59-2 35 08.01.2022 CTD 04:20 01° 20,38' S 085° 49,99' W 2456 400 SO287_59-3 35 08.01.2022 CTD 04:57 01° 20,38' S 085° 50,00' W 2456 2400 SO287_59-4 35 08.01.2022 Radio sonde 05:41 01° 20,38' S 085° 49,99' W 2456 2400 SO287_60-1 36 08.01.2022 CTD (WBAT) 16:14 02° 39,99' S 085° 49,99' W 3156 200 SO287_60-2 36 08.01.2022 Zodiac 16:59 02° 39,99' S 085° 49,89' W 3153 SO287_60-4 36 08.01.2022 Radi									.00
SO287_58-7 34 07.01.2022 Catamaran 19:41 00° 27,19' N 085° 49,99' W 2800 SO287_59-1 35 08.01.2022 Hereon-CTD 04:00 01° 20,38' S 085° 50,00' W 2458 100 SO287_59-2 35 08.01.2022 CTD 04:20 01° 20,38' S 085° 49,99' W 2456 400 SO287_59-3 35 08.01.2022 CTD 04:57 01° 20,38' S 085° 50,00' W 2456 2400 SO287_59-4 35 08.01.2022 Radio sonde 05:41 01° 20,38' S 085° 49,99' W 2460 SO287_60-1 36 08.01.2022 CTD (WBAT) 16:14 02° 39,99' S 085° 49,99' W 3156 200 SO287_60-2 36 08.01.2022 Zodiac 16:59 02° 39,99' S 085° 49,90' W 3153 SO287_60-3 36 08.01.2022 Radio sonde 17:13 02° 39,99' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1000</td></t<>									1000
SO287_59-1 35 08.01.2022 Hereon-CTD 04:00 01° 20,38' S 085° 50,00' W 2458 100 SO287_59-2 35 08.01.2022 CTD 04:20 01° 20,38' S 085° 49,99' W 2456 400 SO287_59-3 35 08.01.2022 CTD 04:57 01° 20,38' S 085° 50,00' W 2456 2400 SO287_59-4 35 08.01.2022 Radio sonde 05:41 01° 20,38' S 085° 49,99' W 2460 SO287_60-1 36 08.01.2022 CTD (WBAT) 16:14 02° 39,99' S 085° 49,99' W 3156 200 SO287_60-2 36 08.01.2022 Zodiac 16:59 02° 39,99' S 085° 49,99' W 3153 SO287_60-3 36 08.01.2022 Radio sonde 17:13 02° 39,99' S 085° 49,89' W 3155 SO287_60-4 36 08.01.2022 Hereon-CTD 17:31 02° 39,98' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) <				` '					1000
SO287_59-2 35 08.01.2022 CTD 04:20 01° 20,38' S 085° 49,99' W 2456 400 SO287_59-3 35 08.01.2022 CTD 04:57 01° 20,38' S 085° 50,00' W 2456 2400 SO287_59-4 35 08.01.2022 Radio sonde 05:41 01° 20,38' S 085° 49,99' W 2460 SO287_60-1 36 08.01.2022 CTD (WBAT) 16:14 02° 39,99' S 085° 49,90' W 3156 200 SO287_60-2 36 08.01.2022 Zodiac 16:59 02° 39,99' S 085° 49,89' W 3153 SO287_60-3 36 08.01.2022 Radio sonde 17:13 02° 39,99' S 085° 49,89' W 3155 SO287_60-4 36 08.01.2022 Hereon-CTD 17:31 02° 39,98' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) 18:03 02° 39,98' S 085° 49,90' W 3157 1000									100
SO287_59-3 35 08.01.2022 CTD 04:57 01° 20,38' S 085° 50,00' W 2456 2400 SO287_59-4 35 08.01.2022 Radio sonde 05:41 01° 20,38' S 085° 49,99' W 2460 SO287_60-1 36 08.01.2022 CTD (WBAT) 16:14 02° 39,99' S 085° 49,90' W 3156 200 SO287_60-2 36 08.01.2022 Zodiac 16:59 02° 39,99' S 085° 49,90' W 3153 SO287_60-3 36 08.01.2022 Radio sonde 17:13 02° 39,99' S 085° 49,89' W 3155 SO287_60-4 36 08.01.2022 Hereon-CTD 17:31 02° 39,98' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) 18:03 02° 39,98' S 085° 49,90' W 3157 1000						·	· ·		
SO287_59-4 35 08.01.2022 Radio sonde 05:41 01° 20,38' S 085° 49,99' W 2460 SO287_60-1 36 08.01.2022 CTD (WBAT) 16:14 02° 39,99' S 085° 49,90' W 3156 200 SO287_60-2 36 08.01.2022 Zodiac 16:59 02° 39,99' S 085° 49,90' W 3153 SO287_60-3 36 08.01.2022 Radio sonde 17:13 02° 39,99' S 085° 49,89' W 3155 SO287_60-4 36 08.01.2022 Hereon-CTD 17:31 02° 39,98' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) 18:03 02° 39,98' S 085° 49,90' W 3157 1000									
SO287_60-1 36 08.01.2022 CTD (WBAT) 16:14 02° 39,99' S 085° 49,90' W 3156 200 SO287_60-2 36 08.01.2022 Zodiac 16:59 02° 39,99' S 085° 49,90' W 3153 SO287_60-3 36 08.01.2022 Radio sonde 17:13 02° 39,99' S 085° 49,89' W 3155 SO287_60-4 36 08.01.2022 Hereon-CTD 17:31 02° 39,98' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) 18:03 02° 39,98' S 085° 49,90' W 3157 1000							·		∠400
SO287_60-2 36 08.01.2022 Zodiac 16:59 02° 39,99' S 085° 49,90' W 3153 SO287_60-3 36 08.01.2022 Radio sonde 17:13 02° 39,99' S 085° 49,89' W 3155 SO287_60-4 36 08.01.2022 Hereon-CTD 17:31 02° 39,98' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) 18:03 02° 39,98' S 085° 49,90' W 3157 1000							·		
SO287_60-3 36 08.01.2022 Radio sonde 17:13 02° 39,99' S 085° 49,89' W 3155 SO287_60-4 36 08.01.2022 Hereon-CTD 17:31 02° 39,98' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) 18:03 02° 39,98' S 085° 49,90' W 3157 1000				· ·			·		200
SO287_60-4 36 08.01.2022 Hereon-CTD 17:31 02° 39,98' S 085° 49,89' W 3156 100 SO287_60-5 36 08.01.2022 CTD (WBAT) 18:03 02° 39,98' S 085° 49,90' W 3157 1000							·		
SO287_60-5 36 08.01.2022 CTD (WBAT) 18:03 02° 39,98' S 085° 49,90' W 3157 1000						·	·		
						·	·		
CO207 CO C 2C 00 04 2022 Cotomore 40.40 020 20 20 20 20 20 20 20 40 20 40 20 40 40 40 40 40 40 40 40 40 40 40 40 40	SO287_60-5	36	08.01.2022	CTD (WBAT)	18:03	02° 39,98' S	085° 49,90' W	3157	1000
50207_00-0 30 $08.01.2022$ Catamaran 19.42 02^3 $39,99^3$ S 085^3 $49,90^7$ W 3154	SO287_60-6	36	08.01.2022	Catamaran	19:42	02° 39,99' S	085° 49,90' W	3154	-