資料９
南極地域観測統合推進本部
第 158 回総会
R3.6.30

南極条約第７条５に基づく事前通告のための電子情報交換システム（EIES）について

外務省地球環境課

１　背景

（１）南極条約第７条５は、各締約国に以下の活動についての通報を求めている。

「各締約国は、この条約がその国について効力を生じた時に、他の締約国に対し、次のことについて通報し、その後は、事前に通告を行う。

（ａ）自国の船舶又は国民が参加する南極地域向けの又は同地域にあるすべての探検隊及び自国の領域内で組織され、又は同領域から出発するすべての探検隊

（ｂ）自国の国民が占拠する南極地域におけるすべての基地

（ｃ）第１条２に定める条件に従って南極地域に送り込むための軍の要員又は備品

（参考：第１条２＝この条約は、科学的研究のため又はその他の平和的目的のために、軍の要員又は備品の使用を妨げるものではない。）

（２）これに基づき、南極条約協議国会議（ATCM）は 2001 年に「決議 6」を採択し、事前に通報・通告すべき事項をとりまとめた。

（３）その後、通報のための共通フォーマットとして「電子情報交換システム(Electronic Information Exchange System: EIES)」　が、2008 年の ATCM で合意された。各締約国がフォーマットに必要事項を入力、承認することで通報内容が公開されるというもの。

２　今回提出する資料

（１）年次報告（Annual Report）＝2020 年４月～2021 年３月に行った活動の事後報告

ア　今期に実施した研究・観測活動を別紙にて提出（2.1.2）

イ　使用基地、観測船（しらせ）・航空機・飛翔体に関する報告（2.2.1）

ウ　保護区域への立ち入り、動植物の採捕等に関する許可に関する報告（2.3）

エ　環境保護関連事項に関する報告（IEE の実施、廃棄物処理の実施）（2.4）

（２）常設報告（Permanent Information）＝恒久的に設置されている設備などの報告

ア　基地、観測船、航空機、自動観測点につき報告（3.1、3.2）

イ　環境保護関連事項に関する報告（廃棄物管理計画、燃料漏出緊急対応計画等）(3.3)

なお、年次報告（Annual Report）における Scientific Information の Forward Plans 及び事前報告（Pre-season Information、2021 年～2022 年に行う活動の事前の通告）については、第 63 次観測隊の計画が確定した後、本年秋に開催される南極地域観測統合推進本部総会に提出する予定。

（了）

2. Annual Report

2.1 Scientific Information

2.1.1 Forward Plans

2.1.2 Science Activities in Previous Year

Please see Table 1

2.2 Operational information

2.2.1 National expeditions

A. Stations

Name: Syowa
Type: winter
Location: Higashi-Ongul To, Lützow-Holmbukta
Latitude: 69° 00′ 25″ S
Longitude: 39° 35′ 01″ E
Max. Population: 130
Medical Facilities: Minimum required surgical operation facilities and dental emergency
Remarks / Description:
Elevation: 28.9 m
Established: January 29, 1957
Major Field Activities: Biological and geophysical observations in Lützow-Holmbukta area

Name: Dome Fuji
Type: Seasonal
Location: On the top of Dronning Maud Land
Latitude: 77° 19′ 01″ S
Longitude: 39° 42′ 12″ E
Max. Population: 14
Medical Facilities: None
Remarks / Description:
Elevation: 3,810m
Established in January 29, 1995
There are 9 buildings below snow surface. 9 people can be accommodated.
Operating Period: from November to February
Major Field Activities: Glaciological survey

B. Non-Military Ships
None

C. Non-Military Aircraft
None

D. Research Rockets
Please see Table 2

E. Military
Ship
Name: R/V Shirase
Country of registry: Japan
Maximum Crew (Number of military personnel in expeditions): 179
Maximum Passengers: 80
Remarks: The Indian sector of the Southern Ocean (SO) and SO south of Australia will be visited.
Ice strength: breaking 1.5 m thick at the speed of 3 knots.
Voyage Departure Date: 20 November, 2020
Voyage Departure Port: Yokosuka, Japan
Voyage Arrival Date: 22 February, 2021
Voyage Arrival Port: Yokosuka, Japan
Voyage Purpose: Transportation of cargo and personnel / Support of oceanographic and field observations
Site Name: Lützow-Holmbukta, Kronprins Olav Kyst
Area Operation Date: From 13, December, 2020 to 24 January, 2021

Aircraft
Type: CH-101
Quantity: 2
Category: Local helicopter flights
Period From: December 2020
Period To: January, 2021
Remarks: transportation of cargo and personnel / support of field observations
Flight Departure Date: December, 2020
Flight Route: Between Shirase and Syowa Station/field camps
Flight Purpose: Logistics
Maximum Crew: 4
Maximum Passengers: depends on flight distance.

2.2.2 Non-governmental expeditions

Vessel-Based Operations

None

Land-Based Operations

None

Aircraft Activities

None

Denial of Authorizations

None

2.3 Permit Information

2.3.1 Visits to Protected Areas

ASPA No	Number of people:	Permit Period:	Purpose:	Summary of activities:	Event or project name/number:
No.141 Yukidori Valley, Langhovde	24	From: 1 Dec 2020 To: 31 Mar 2021	Research	Precise geodetic network surveys	62th Japanese Antarctic Research Expedition
No.141 Yukidori Valley, Langhovde	1	From: 1 Dec 2020 To: 31 Mar 2021	Research	Risk identification related to activities of parties, and development of safety education programme for field activities	62th Japanese Antarctic Research Expedition
No.141 Yukidori Valley, Langhovde	1	From: 1 Dec 2020 To: 31 Mar 2021	Research	Reporting	62th Japanese Antarctic Research Expedition

2.3.2 Taking and harmful interference with flora and fauna

None

2.3.3 Introduction of non-native species

No.	Permit period:	Species (and Amount):	Location:	Action:	Removal or Disposal:	Purpose:
1	From: 1 Dec 2020	Poultry meat (e.g. chicken, turkey, duck, foie gras, and entrails)	Syowa station (69°00'S, 39°35'E)	Introduction new species:	Removal	Food

	To: 31 Mar 2021					
2	From: 1 Dec 2020 To: 31 Mar 2021	5 tons of variety of fresh vegetables and 10 kg of seeds for hydroponics	Syowa station (69°00'S, 39°35'E)	Introduction new species:	Removal	Food
3	From: 1 Dec 2020 To: 31 Mar 2021	1 kg of yeast, 1 kg of beer yeast, 5 kg of rice-malt, and 100 kg of mushroom bed for cultivation of mushroom	Syowa station (69°00'S, 39°35'E)	Introduction new species:	Removal	Food
4	From: 1 Dec 2020 To: 31 Mar 2021	200 kg of “Bacillus subtilis BN1001” for the treatment of sewage, fats and oil in grease traps and water-purifier tanks	Syowa station (69°00'S, 39°35'E)	Introduction new species:	Removal and Disposal	Treatment of sewage, fats and oil

2.4 Environmental Information

2.4.1 Compliance with the Protocol

None

2.4.2 Contingency Plans

No new plans were made or implementation action taken during this reporting period.

2.4.3 List of IEEs and CEEs

Type: IEE
Activity: Construction (Construction at Syowa station)
Year: 2020
Title: 62th Japanese Antarctic Research Expedition
Location: Syowa Station (69° 00’S, 39° 35’E)
Organization responsible: Headquarters of the Japanese Antarctic Research Expedition
Decision: Proceed (No more than a minor or transitory impact)

2.4.4 Monitoring activities report

None

2.4.5 Waste Management Plans

Title: Waste Management Guide
Fixed Site / Field Camp / Ship: Station and Field
Implementation Report: Disposal of wastes in the stations and fields is implemented in

accordance with Annex III of the Protocol on Environmental Protection to the Antarctic Treaty and the relevant national legislation. Sewage and gray water from summer accommodation are treated by non-biological method (Coagulation-Sedimentation Method), and Sewage and gray water from year-round accommodation are treated by membrane separation activated sludge process and the treated water is discharged into the sea. All the wastes are sorted and treated properly. Combustible wastes are disposed of by a two-stage incinerator. The ash is taken back to Japan. Wet food waste is treated by a dehydrating instrument. The residue is directly taken back to Japan or incinerated, and its ash is also taken back to Japan. The other waste is taken back to Japan.

Contact Point:

Name: Kazuo
Surname: Higuchi
Job Title or Position: Head of Logistics Section, National Institute of Polar Research
Phone: +81-42-512-0779 Email: higuchi.kazuo@nipr.ac.jp

2.4.6 Measures taken to implement the provisions of Annex V

None

2.4.7 Procedures relating to EIAs

None

2.4.8 Prevention of marine pollution

None

(END)

3. Permanent Information

3.1. Science Facilities

3.1.1 Automatic Recording Stations/Observatories

-Location:
Site Name: Relay Point (MD364)
Latitude: 74° 00′ 29″ S
Longitude: 42° 59′ 48″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,353m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure, humidity, surface height
Observation Frequency: 10 minutes
Reference Number: AWS No. 8918 / WMO No. 89744
Scientific Equipment:

-Location:
Site Name: Dome Fuji
Latitude: 77° 19′ 00″ S
Longitude: 39° 42′ 11″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,810m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure
Observation Frequency: 10 minutes
Reference Number: AWS No. 8904 / WMO No. 89734
Scientific Equipment:

-Location:
Site Name: JASE2007 (DK379)
Latitude: 75° 53′ 17″ S
Longitude: 25° 50′ 01″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,661m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure
Observation Frequency: 10 minutes
Reference Number: AWS No. 30305
Scientific Equipment:

-Location
Site Name: New Dome Fuji
Latitude: 77° 47′ 20″ S
Longitude: 39° 03′ 09″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,763m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure, relative humidity, snow height, downward/upward shortwave and longwave radiation, ice temperature
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment:

-Location:
Site Name: H128
Latitude: 69° 24′ 05″ S
Longitude: 41° 32′ 41″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 1,383m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure, relative humidity, snow height, downward/upward shortwave and longwave radiation, ice temperature
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment

-Location:
Site Name: New Relay Point (MD364)
Latitude: 74° 01′ 48″ S
Longitude: 43° 00′ 00″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,353m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure, relative humidity, snow height, ice temperature
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment

-Location:
Site Name: MD78 (MD78)

Latitude: 71° 26′ 55″ S
Longitude: 44° 00′ 32″ E
Type: Automatic Weather Station (ARGOS Type)
Elevation: 3,353m
Parameters Recorded: temperature, wind speed, wind direction, atmospheric pressure, relative humidity, snow height, ice temperature
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment

-Location:
Site Name: Langhovde
Latitude: 69° 15′ S
Longitude: 39° 43′ E
Type: Seismic observation by Guralp seismometer
Elevation: 28m
Parameters Recorded: 3 components (NS, EW, Z)
Observation Frequency: nearly year-round by 10 Hz sampling
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Skallen
Latitude: 69° 40′ S
Longitude: 39° 25′ E
Type: Seismic observation by Guralp seismometer
Elevation: 28m
Parameters Recorded: 3 components (NS, EW, Z)
Observation Frequency: nearly year-round by 10 Hz sampling
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Rundvågshetta
Latitude: 69° 55′ S
Longitude: 39° 02′ E
Type: Seismic observation by Guralp seismometer
Elevation: 37m

Parameters Recorded: 3 components (NS, EW, Z)
Observation Frequency: nearly year-round by 10 Hz sampling
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Langhovde
Latitude: 69° 14′ 35″ S
Longitude: 39° 42′ 53″ E
Type: GNSS remote base station
Elevation: 10m
Parameters Recorded: GNSS
Observation Frequency: 30 Seconds
Reference Number: None
Scientific Equipment:

-Location:
Site Name: IGS Tracking Site at Syowa Station (SYOG)
Latitude: 69° 00′ 25″ S
Longitude: 39° 35′ 01″ E
Type: GNSS remote base station
Elevation: 29m
Parameters Recorded: GNSS
Observation Frequency: 1 Second
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Yukidori Zawa
Latitude: 69° 14′ 30″ S
Longitude: 39°44′ 22″ E
Type: Automatic Weather Station
Elevation: 55 m
Parameters Recorded: Air temperature, humidity, Air pressure, Wind direction, Wind speed, Solar radiation, UV radiation, Photosynthetically Active Radiation
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Oyako Ike
Latitude: 69° 28′ 25″ S
Longitude: 39° 36′ 40″ E
Type: Automatic Weather Station
Elevation: 2 m
Parameters Recorded: Air temperature, humidity, Air pressure, Wind direction, Wind speed, Solar radiation, UV radiation, Photosynthetically Active Radiation
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Skallen Oike
Latitude: 69° 40′ 26″ S
Longitude: 39° 24′ 15″ E
Type: Automatic Weather Station
Elevation: 10m
Parameters Recorded: Air temperature, humidity, Air pressure, Wind direction, Wind speed, Solar radiation, UV radiation, Photosynthetically Active Radiation
Observation Frequency: 10 minutes
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Oyako Ike
Latitude: 69° 28′ 36″ S
Longitude: 39° 36′ 06″ E
Type: Limnological Station
Elevation: 2 m
Parameters Recorded: Water temperature, Underwater light intensity, Chlorophyll fluorescence, Turbidity, Water level
Observation Frequency: 1 hour
Reference Number: None
Scientific Equipment:

-Location:

Site Name: Naga Ike
Latitude: 69° 29′ 12″ S
Longitude: 39° 35′ 54″ E
Type: Limnological Station
Elevation: 70 m
Parameters Recorded: Water temperature, Underwater light intensity, Chlorophyll fluorescence, Turbidity, Water level
Observation Frequency: 1 hour
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Nurume Ike
Latitude: 69° 13′ 23″ S
Longitude: 39° 39′ 33'E
Type: Limnological Station
Elevation: 2 m
Parameters Recorded: Water temperature, Underwater light intensity, Chlorophyll fluorescence, Turbidity
Observation Frequency: 1 hour
Reference Number: None
Scientific Equipment:

-Location:
Site Name: Dome Fuji
Latitude: 77° 19′ 02” S
Longitude: 39° 42′ 32″ E
Type: Low Power Magnetometer (BAS Type)
Elevation: 3,783m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 17mHz～1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Relay Point (MD364)
Latitude: 74° 00′ 37″ S
Longitude: 42° 59′ 30″ E

Type: Low Power Magnetometer (BAS Type)
Elevation: 3,353m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 17mHz～1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Mizuho
Latitude: 70° 42′ 06″ S
Longitude: 44° 16′ 47″ E
Type: Low Power Magnetometer (BAS Type)
Elevation: 2,250m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 17mHz～1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Skallen
Latitude: 69° 40′ 21″ S
Longitude: 39° 24′ 07″ E
Type: Low Power Magnetometer (NIPR Type)
Elevation: 11m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: H68
Latitude: 69° 11′ 32″ S
Longitude: 41° 03′ 01″ E
Type: Low Power Magnetometer (NIPR Type)
Elevation: 1,175m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 1 Hz
Reference Number: None

Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Innhovde
Latitude: 69° 51′ 21″ S
Longitude: 37° 06′ 31″ E
Type: Low Power Magnetometer (NIPR Type)
Elevation: 57m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Amundsen Bay
Latitude: 66° 47′ 44″ S
Longitude: 50° 34′ 38″ E
Type: Low Power Magnetometer (NIPR Type)
Elevation: 37m
Parameters Recorded: magnetic 3 components (H, D, Z)
Observation Frequency: 1 Hz
Reference Number: None
Scientific Equipment: 3-axis fluxgate magnetometer

-Location:
Site Name: Amundsen Bay
Latitude: 66° 47′ 44″ S
Longitude: 50° 34′ 43″ E
Type: Unmanned Aurora Observatory
Elevation: 87m
Parameters Recorded: all-sky aurora image, magnetic 3 components (H, D, Z), GNSS TEC value
Observation Frequency: all-sky imager:1Hz, magnetometer:1 Hz, GNSS-TEC: every 30 sec
Reference Number: None
Scientific Equipment: All-sky imager, 3-axis fluxgate magnetometer, GNSS receiver

3.2 Operational Information

A. Stations

Name: Syowa
Type: Year-Round
Location: Higashi-Ongul To, Lützow-Holmbukta
Latitude: 69° 00′ 25″ S
Longitude: 39° 35′ 01″ E
Max. Population: 130
Medical support available: Minimum required surgical operation facilities and dental emergency

Name: Dome Fuji
Type: Seasonal
Location: On the top of Dronning Maud Land
Latitude: 77° 19′ 01″ S
Longitude: 39° 42′ 12″ E
Max. Population: 14
Medical support available: None

B. Non-Military Ships

None

C. Non-Military Aircraft

None

D. Military

Ship
Name: R/V Shirase
Country of registry: Japan
Maximum Crew (Number of military personnel in expeditions): 179
Maximum Passengers: 80

Aircraft
Type: CH-101
Quantity: 2
Maximum Crew: 4
Maximum Passengers: depends on flight distance.

3.3 Environmental Information

3.3.1 Waste Management Plans

Title: Waste Management Guide

Fixed site/Field Camp/Ship: Station and field

Objective: Management of field Wastes, Station Wastes

Implementation Report: Disposal of wastes in the stations and fields is implemented in accordance with Annex III of the Protocol on Environmental Protection to the Antarctic Treaty and the relevant national legislation. Sewage and gray water from summer accommodation are treated by non-biological method (Coagulation-Sedimentation Method), and Sewage and gray water from winter accommodation are treated by membrane separation activated sludge process and the treated water is discharged into the sea. All the wastes are sorted and treated properly. Combustible wastes are disposed of by a two-stage incinerator. The ash is taken back to Japan. Wet food waste is treated by a carbonization instrument. The residue is directly taken back to Japan or incinerated, and its ash is also taken back to Japan. The other waste is taken back to Japan.

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3.3.2 Contingency Plans

Title: Syowa Station Oil Spill Contingency Plan

Scope / Coverage of the plan: The expedition contingency plans are made and published for respective operations before departure from Japan and the expedition members act as keeping the plans.

An oil spill contingency plan for Syowa Station was first compiled in 1987 and the plan was revised in 2008.

Objective: Contingency plan to respond safely and promptly to oil spill at Syowa Station and to minimize human, environmental and physical loss or damage.

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3.3.3 Inventory of Past Activities

Activity Type: Scientific observation, including ice core drilling
Location:
Site name: Mizuho
Latitude: 70° 41′ 58″ S
Longitude: 44° 16′ 52″ E
Description of Activity: Meteorological, glaciological observations and used for a relay station for inland traverses.
Period of Activity:
Date Begin: July 21, 1970
Date End: 1986
Remaining Equipment or Facilities: Five huts including diesel generators, communication antennas and an observation tower.

Activity Type: Scientific observation
Location:
Site name: Asuka
Latitude: 71° 31′ 29″ S
Longitude: 24° 07′ 50″ E
Description of Activity: Meteorological observations and used for a base station for glaciological observations in the Sør Rondane Mountains
Period of Activity:
Date Begin: March 26, 1985
Date End: December, 1991
Remaining Equipment or Facilities: Five huts including diesel generators, communication antennas and a small wind turbine.

3.3.4 Compliance with the Protocol

None

3.3.5 Procedures relating to EIAs

None

3.3.6 Prevention of marine pollution

None

3.3.7 Measures taken to implement the provisions of Annex V

None

3.4 Other Information

3.4.1 Relevant National Legislation

None

(END)

Scientific Activities - JARE 61W 62S

ID	Project name	Main Activities / Remarks	Site Name	Latitude /Longitude	Season Summer	Season Winter	Discipline	PI	URL
	Research Project								
	Prioritized Research Project: Investigation of changes in the Earth system from Antarctica								
AJ0901	A study on the global atmosphere system based on high-resolution observations of the Antarctic atmosphere	Observations of the Antarctic atmosphere were performed during JARE61 in order to examine various processes and their role in the global atmospheric system by utilizing (1) the PANSY (Program of the Antarctic Syowa MST/IS) radar, which is the largest atmospheric radar in the Antarctic, and (2) related instruments such as up-graded millimeter wave spectrometer, MF radar, OH IR airglow imager, high-speed auroral imager, and proton auroral spectrograph. The fifth and sixth campaigns of Interhemispheric Coupling Study by Observations and Modeling (ICSOM) were also successfully conducted.	Syowa	69°00'25"S, 39°35'01"E	○	○	Atmospheric sciences	Name: Kaoru Surname: Sato Job Title or Position: Professor, Graduate School of Science, The University of Tokyo Phone: +81-3-5841-4668 Email: kaoru@eps.s.u-tokyo.ac.jp	
AJ0902	Research of Ocean-ice Boundary Interaction and Change around Antarctica	Geodetic network observations of ice motion and deformation were conducted using GPS/ GNSS on Shirase Glacier, in Lutzow-holm Bay. ing by station/moored instruments.	Lützow-Holmbukta Shirase Glacier		○		Climate studies	Name: Shigeru Surname: Aoki Job Title or Position: Associate Professor, ILTS, Hokkaido University Email: shigeru@lowtem.hokudai.ac.jp	
	Ordinary Research Project								
AP0925	Space weather study during the cycle 24/25 solar activity minimum using cosmic ray observations at Syowa base	Continue cosmic ray observations with installed a pair of neutron monitor and muon detector at Syowa Station. Duty cycle of this observations was >95%. Data are updated regulary at the following URL. http://polaris.nipr.ac.jp/~cosmicrays	Syowa Station	69°00'25"S, 39°35'01"E	○	○	Astrophysics	Name: Chihiro Surname: Kato Job Title or Position: Professor, Shinshu University Phone: +81-263-37-2514 Email:ckato@shinshu-u.ac.jp	
AP0926	Large area network observation of auroral phenomena using unmanned system	Low-power autonomous auroral observation system at Amundsen Bay and Princess Elisabeth Antarctica Station has been working continuously all through the year. An auroral imager system at Maitri Station has been operated from March to September. Unmanned magnetometer network around Amundsen Bay and Lützow-Holmbukta area and along the route from Mizuho to Dome Fuji was maintained.	Syowa Station Amundsen Bay Skallen, Inhhovde, H68 Mizuho, MD364, Dome Fuji Princess Elisabeth Station Maitri Station		○	○	Earth and atmospheric sciences - other	Name: Akira Surname: Kadokura Job Title or Position: Professor, ROIS Phone: +81-42-512-9105 Email: kadokura@nipr.ac.jp	
AP0927	Dynamics of magnetosphere and ionosphere by using mult-wavelength, simultaneous observations of auroras at South Pole and McMurdo stations	We have remotely operated all-sky imagers at South Pole Station and McMurdo Station to observe high-latitude auroras.	South Pole Station McMurdo Station		○	○	Earth and atmospheric sciences - other	Name: Yusuke Surname: Ebihara Job Title or Position: Associate Professor, Kyoto University Phone: +81-774-38-3844 Email: ebihara@rish.kyoto-u.ac.jp	
AP0928	Study on polar upper atmosphere in possible grand minimum period and inner magnetosphere dynamics with SuperDARN radars	With SENSU SuperDARN HF radars at Syowa station, continuous observation according to the international SuperDARN schedule including special campains with satellites such as ERG/Arase was conducted to try to reveal the influence of low solar activity period on upper atmosphere and the dynamics of inner magnetosphere as well as to contribute to space weather research.	Syowa station	69°00'25"S, 39°35'01"E	○	○	Earth and atmospheric sciences - other	Name: Akira Sessai Surname: Yukimatu Job Title or Position: Associate Professor, NIPR Email: sdsensuats@uap.nipr.ac.jp	URL: http://polaris.nipr.ac.jp/~SD/
AP0940	Generation Mechanism of the Lightning-exciting AC & DC Global Electrical Circuits and Their Relation to Atmospheric Disturbances	Continuous measurements of ELF electromagnetic waves in the frequency range of 1-100Hz and atmospheric DC electric field were carried out. During the 2020-2021 season, there was no serious trouble with the observation systems. We succeeded in acquiring the continuous ELF waveform and atmospheric electric field waveform data.	Nishi-Ongul To (Island) Higashi-Ongul To (Island)	for ELF observation: 69°01'05"S 39°30'21"E for DC electric field obs.: 69°00'18"S 39°35'08"E	○	○	Earth and atmospheric sciences - other	Name: Mitsuteru Surname: Sato Job Title or Position: Professor, Faculty of Science, Hokkaido University Phone: +81-11-706-2763 Email: msato@ep.sci.hokudai.ac.jp	
AP0931	Advanced balloon-borne observations of the Antarctic upper troposphere and lower stratosphere (UTLS)	Balloon-borne water vapor observations were carried out at Syowa Station in austral summer. Super-pressure balloon and its on-board instrument were developed in Japan.	Syowa	69°00'25"S, 39°35'01"E	○	○	Atmospheric sciences	Name: Yoshihiro Surname: Tomikawa Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0660 Email: tomikawa@nipr.ac.jp	
AP0932	Changing of East Antarctic aerosols in global biogeochemical environment	1) Observation of optical property and aerosol concentration along cruise track of R/V Shirase by ship borne, aureolemeter, Scaning Mobility Particle Sizer, optical particle counter during summer. 2) Aerosol sampling for size distribution of chemical constituent analyses along cruise track of R/V Shirase during summer. 3) Measurement of optical absorption coefficient of aerosol at Syowa Station by an aethalometer and MAAP all year round. 4) Aerosol sampling for analyses of stabel and radio active isotops ratios at Syowa Station all year round. 5) Aerosol sampling for analyses of chemical constituents at Syowa Station all year round.	Along cruse track of R/V Shirase Syowa Station	69°00'25"S, 39°35'01"E	○	○	Atmospheric sciences	Name: Masahiko Surname: Hayashi Job Title or Position: Professor, Faculty of Science, Fukuoka University Phone: +81-871-6631 ex.6168 Email: mhayashi@fukuoka-u.ac.jp	
AP0933	Detection of influences of global warming in East Antarctic atmosphere and ice-sheet surface, and clarifying the mechanisms	Maintaining AWS (Automatic Weather Station) at key stations around Droning Maud Land and Be-7 sampling at Syowa Station to record climatic change and to understand its mechanism.	Syowa Droning Maud Land (along traverse route from S16 to MD78)	69°00'25"S, 39°35'01"E	○	○	Climate studies	Name: Naohiko Surname: Hirasawa Job Title or Position: Assistant Professor, NIPR Phone: +81-42-512-0685 Email: hira.n@nipr.ac.jp	
AP0934	Annual observation of amount of snowfall by using a precipitation radar around Syowa Station, Antarctica	The X-band radar was installed in the summer period at Syowa Station, and the radar observation was carried out from March. The data are obtained every several seconds continually.	Syowa	69°00'25"S, 39°35'01"E	○	○	Atmospheric sciences	Name: Hiroyuki Surname: Konishi Job Title of Position: Osaka Kyoiku Univ./Faculty of education/ Professor Phone: *81-72-978-3640 E-mail: konishi@cc.osaka-kyoiku.ac.jp	
AP0935	Study on surface environmental variation in polar region by using seismic and infrasound	Multiple-sites arrayed observation of infrasound has been studied to reveal the energy transportation among the ionosphere, atmosphere, ocean, cryosphere, and geosphere in Antarctica. The target is to identify the infrasound generated by icequake, motion of icesheets and ice fields, blizzard, aurora, etc. by the arrayed observation. The infrasound, long-period barometric waves, might be a good proxy for studying climate changes.	Syowa/ Langhovde/ Skarvsnes Skallen/ Rundvågshetta/ Akarui-Misaki	69°00'25"S, 39°35'01"E 69°15'00"S, 39°43'01"E	○	○	Geophysics and seismology	Name: Masaki Surname: Kanao Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0713 Email: kanao@nipr.ac.jp	
AP0924	Medical researches on Antarctic expeditioners under extreme environment	Activity amount, and changes in body composition and psychological state were analyzed during the wintering period.	Syowa		○	○	Biological sciences – other	Name: Satoshi Surname: Imura Job Title or Position: Professor, NIPR Phone: +81-42-512-0602 Email: imura@nipr.ac.jp	
	Exploratory Research Project								
AH0909	Aurora and airglow observations with all-sky imagers on Shirase to fill the observation gap over the ocean	Continuous measurments of aurora and airglw at a wavelength of 630 nm and 670nmm were successfully carried out in the nighttime during the period from November 20 2020 to Feburuary 22 2020 using the 3-axis stabilized gimbaal onbard R/V Shirase.	Along cruise track of R/V Shirase		○		Earth and atmospheric sciences - other	Name: Takeshi Surname: Sakanoi Job Title or Position: Associate Professor, Tohoku University Phone: +81-22-795-6609 Email: tsakanoi@pparc.gp.tohoku.ac.jp	
AH0908	Development of safety education program for field sciences based on practical knowledge of risk treatment	This study investigates practical knowledge of treating risk in extreme natural environment, which might be obtained in experience of Antarctic research expedition. On-site video using wearable camera was taken by the FA for about two hours. Since an appointed member could not be participated in the expedition because of Covid-19, interview based on the video has not yet be conducted.	Syowa, S17, and coastal area of Lützow-Holm bay.		○	○	Psychology	Name: Shin Surname: Murakoshi Job Title or Position: Professor, Shizuoka University Phone: +81-54-238-4665 Email: murakoshi.shin@shizuoka.ac.jp	
	Fundamental Observation								
	Monitoring Observation								
AMS0901	Data acquisition of Earth observing satellites	Data acquisition of NOAA, METOP-1, DMSP, AQUA, TERRA and NPP polar orbiting Earth observation satellites with L/S/X-band receiving facility at Syowa.	Syowa	69°00'25"S, 39°35'01"E	○	○	Other	Name: Naohiko Surname: Hirasawa Job Title or Position: Assistant Professor, NIPR Phone: +81-42-512-0685 Email: hira.n@nipr.ac.jp	
AMU0901	Auroral optical observation	Auroras were monitored with all-sky electron and proton auroral imagers (EAI and PAI), an all-sky color digital camera (CDC), all-sky black and white TV cameras (ATV), and scanning photometer (SPM) from late February to early October at Syowa.	Syowa	69°00'25"S, 39°35'01"E	○	○	Earth and atmospheric sciences - other	Name: Akira Surname: Kadokura Job Title or Position: Professor, ROIS Phone: +81-42-512-9105 Email: kadokura@nipr.ac.jp	
AMU0902	Geomagnetism observation	Absolute geomagnetic observation was carried out every month and geomagnetic variation observation with a 3-axis fluxgate magnetometer was carried out continuously all through the year at Syowa.	Syowa	69°00'25"S, 39°35'01"E	○	○	Earth and atmospheric sciences - other	Name: Akira Surname: Kadokura Job Title or Position: Professor, ROIS Phone: +81-42-512-9105 Email: kadokura@nipr.ac.jp	
AMU0903	Monitoring observation of Geospace phenomena at West Ongul Island	Cosmic Noise Absorption (CNA) was observed with two sets of riometers and natural VLF and ULF waves were observed with two sets of loop antennas and two sets of induction magnetometers at West-Ongul To (Island) continuously all through the year.	Syowa West Ongul Island	69°00'25"S, 39°35'01"E	○	○	Earth and atmospheric sciences - other	Name: Akira Surname: Kadokura Job Title or Position: Professor, ROIS Phone: +81-42-512-9105 Email: kadokura@nipr.ac.jp	
AMP0901	Monitoring of atmospheric greenhouse gases and related constituents	Monitoring of atmospheric CO2, CH4, CO, N2O and O2 concentrations was carried out all year-round at Syowa Station. Whole air samples were collected periodically for subsequent analyses in Japan.	Syowa	69°00'25"S, 39°35'01"E	○	○	Atmospheric sciences	Name: Daisuke Surname: Goto Job Title or Position: Assistant Professor, NIPR Phone: +81-42-512-0673 Email: goto.daisuke@nipr.ac.jp	
AMP0902	Monitoring of aerosol and clouds	Aerosol and clouds were monitored by remote-sensing and in-situ measurements at Syowa for investigating their climate impact. All-sky images were recorded every 10 minutes to monitor cloud cover all year-round. Vertical distributions of cloud aerosols were monitored continuously with a micro-pulse lidar. A sky radiometer monitored solar radiation and aerosol optical properties from mid-October to early May. Size distribution of aerosol was monitored continuously at the aerosol observation hut all year-round as well as aethalometer observation.	Syowa	69°00'25"S, 39°35'01"E	○	○	Atmospheric sciences	Name: Naohiko Surname: Hirasawa Job Title or Position: Assistant Professor, NIPR Phone: +81-42-512-0685 Email: hira.n@nipr.ac.jp	http://mplnet.gsfc.nasa.gov/
AMP0903	Monitoring of Antarctic ice sheet mass balance	Sea ice thickness and snow depth measurements from Syowa Station to Tottuki Misaki. Snow accumulation measurements by snow stake method and surface snow samplings from Tottuki Misaki to S16 site. Snow accumulation measurements and surface snow samplings and maintenance of automatic weather stations from S16 to inland Mizuho Station.	From Syowa Station to S16 site via Tottuki Misaki Inland sites from S16 to Dome Fuji		○	○	Glaciology	Name: Hideaki Surname: Motoyama Job Title or Position: Professor, NIPR Phone: +81-42-512-0680 Email: motoyama@nipr.ac.jp	

ID	Project name	Main Activities / Remarks	Site Name	Latitude /Longitude	Season		Discipline	PI	URL
					Summer	Winter			
AMP0904	Sea ice and hydrographic observations onboard icebreaker Shirase and in Lützow-Holm Bay oceanography	Measurements of sea ice thickness, ice concentration, water temperature/salinity profile, and water current profile. Monitoring of vessel movement during ice navigation.	Along cruise track of R/V Shirase, Near Syowa		○		Oceanography	Name: Shuki Surname: Ushio Job Title or Position: Professor, NIPR Phone: +81-42-512-0676 Email: ushio@nipr.ac.jp	
AMG0901	Integrated Geodetic monitoring observation	Monitoring of a fixed point location in Syowa was carried out with a DORIS antenna operating all year-round. Ground temperature was monitored all year-round at sites near the Zakuro Ike in Langhovde and near the Ô-ike, in Nishi-Ongul To (Island). VLBI experiments were carried out 11 times a year using a mult-purpose 11 meter diameter dish and gravity was monitored with a superconductivity gravimeter at Syowa. Tide was monitored near Syowa with a GNSS buoy almost all year-round. Crustal movements were monitored by GNSS measurements on several outcrop rocks around Syowa.	Syowa/ Nishi-Ongul Is. (ground temperature)/ Langhovde (ground temperature)/ Akarui-misaki Tottuki-misaki/ Mukai-iwa Langhovde /Skarvsnes Skallen /Rundvagshetta Padda Is.	69°00'25"S, 39°35'1"E 69°01'20"S, 39°33'31"E 69°10'41"S, 39°38'49"E 68°29'58" S 41°24'23" E 68°54'40"S, 39°49'10"E 69°01'48"S,39°41'43"E 69°14'34"S, 39°42'51"E 69°28'26"S, 39°36'25"E 69°40'16"S, 39°23'56"E 69°54'27"S, 39°02'24"E 69°37'06"S, 38°16'34"E	○	○	Geophysics and seismology	Name: Koichiro Surname: Doi Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0701 Email: doi@nipr.ac.jp	
AMG0902	Seismic monitoring observation	Seismometers are installed to monitor earthquakes at Syowa Station and four sites on the Sôya Kaigan all year-round.	Syowa Station and four sites on the Sôya Kaigan	69°00'25"S, 39°35'01"E	○	○	Geophysics and seismology	Name: Masaki Surname: Kanao Job Title or Position: Associate Professor, NIPR Email: kanao@nipr.ac.jp	
AMG0903	Marine geophysical observations	Marine geomagnetic measurement is conducted onboard the R/V Shirase along the cruise tracks. Sea bottom pressure is monitored with a pressure gauge installed and recovered every summer on the sea bottom about 4000 meters deep in the Southern.	Along cruise track of R/V Shirase		○		Geophysics and seismology	Name: Yoshifumi Surname: Nogi Job Title or Position: Professor, NIPR Phone:+81-42-512-0603 Email: nogi@nipr.ac.jp	
AMG0904	Infrasound observation	Arrayed observation of infrasound has been carried out at Syowa Station all year-round.	Syowa	69°00'25"S, 39°35'01"E	○	○	Geophysics and seismology	Name: Masaki Surname: Kanao Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0713 Email: kanao@nipr.ac.jp	
AMB0901	Population census of Adélie penguins	Census of Adélie penguins at rockeries in the Sôya Kaigan area was carried out in mid-November and early December. Number of the penguins and the pairs were counted.	Sôya Kaigan area			○	Biological sciences – other	Name: Akinori Surname: Takahashi Job Title or Position: Associate Professor, NIPR Phone: +81-42-512-0741 Email: atak@nipr.ac.jp	
AMB0902	Marine ecosystem monitoring	Oceanographic observations in the Southern Ocean along the cruise track of R/V Shirase were carried out south of latitude 40 degrees south via water off Syowa. Surface water was pumped up to measure physical, chemical and biological parameters, including chlorophyll a and pCO2 concentrations. Water collections at some depths and plankton collections are carried out at stations off syowa, including those in ice covered areas.	Along cruise track of R/V Shirase		○		Biological sciences – other	Name: Tsuneo Surname: Odate Job Title or Position: Professor, NIPR Phone: +81-42-512-0738 Email: odate@nipr.ac.jp	
AMB0903	Monitoring of Antarctic terrestrial ecosystems	48 soil samples for analyzing micro-organisms were collected at fixed points around Syowa station.	Syowa	69°00'25"S, 39°35'01"E	○		Bioscience	Name: Satoshi Surname: Imura Job Title or Position: Professor, NIPR Phone: +81-42-512-0602 Email: imura@nipr.ac.jp	
	Routine Observation								
TC01	Bathymetric survey	Bathymetric survey	Lützow-Holmbukta		○		Oceanography	Name: Katsuhiro Surname: Kusunoki Job Title or Position: Director, Coastal Surveys Division Hydrographic and Oceanographic Department, Japan Coast Guard Phone: ＋81-3-3595-3606 Email: nankyoku@jodc.go.jp	https://www1.kaiho.mlit.go.jp/TIDE/gauge/syowa_tidecurve.php
TC02	Tidal observation	Tidal observation	Syowa	69°00'25"S, 39°35'01"E	○	○	Oceanography	Name: Katsuhiro Surname: Kusunoki Job Title or Position: Director, Coastal Surveys Division Hydrographic and Oceanographic Department, Japan Coast Guard Phone: ＋81-3-3595-3606 Email: nankyoku@jodc.go.jp	https://www1.kaiho.mlit.go.jp/TIDE/gauge/syowa_tidecurve.php
TG01	Geodetic observations	Precise Geodetic Observations (GNSS Observation) Precise Geodetic Observations (Relative Gravity Survey) Leveling	Syowa Coastal area of Lützow-Holm bay Kronprins Olav Kyst Ongul Island P50,S16 and S17 site	69°00'25"S, 39°35'01"E	○	○	Geomorhology	Name: Takuya Surname: Nojiri Job Title or Position: Executive Officer for Promoting International Cooperation, Planning Dept., Geospatial Information Authority of Japan Phone: +81-29-864-6910 Email: gsi-antarctic@gxb.mlit.go.jp	https://www.gsi.go.jp/antarctic/index-e.html
TG02	Topographic survey	Photocontrol points surveying Aerial photography	Ongul Island	69°00'25"S, 39°35'01"E	○		Geomorhology	Name: Takuya Surname: Nojiri Job Title or Position: Executive Officer for Promoting International Cooperation, Planning Dept., Geospatial Information Authority of Japan Phone: +81-29-864-6910 Email: gsi-antarctic@gxb.mlit.go.jp	https://www.gsi.go.jp/antarctic/index-e.html
TJM01	Surface synoptic observation	Air Pressure Air Temperature Humidity Wind speed Wind direction Sunshine duration Global solar radiation Snow depth	Syowa	69°00'25"S, 39°35'01"E	○	○	Meteorology	Name: Yutaka Surname: Ogawa Job Title or Position: Head, Office of Antarctic Observation, Atmosphere and Ocean Department, Japan Meteorological Agency (JMA) Phone: +81-3-3434-9105 Email: antarctic@met.kishou.go.jp	https://www.jma.go.jp/jma/indexe.html
TJM02	Upper-air observation	Radiosonde/ Atmospheric pressure, Air temperature, Humidity, Wind speed, Wind direction	Syowa	69°00'25"S, 39°35'01"E	○	○	Meteorology	Name: Yutaka Surname: Ogawa Job Title or Position: Head, Office of Antarctic Observation, Atmosphere and Ocean Department, Japan Meteorological Agency (JMA) Phone: +81-3-3434-9105 Email: antarctic@met.kishou.go.jp	https://www.jma.go.jp/jma/indexe.html
TJM03	Ozone observations	Total ozone Umkehr Surface ozone Ozonesonde/ Ozone amount, Atmospheric pressure, Air temperature, Humidity, Wind speed, Wind direction	Syowa	69°00'25"S, 39°35'01"E	○	○	Meteorology	Name: Yutaka Surname: Ogawa Job Title or Position: Head, Office of Antarctic Observation, Atmosphere and Ocean Department, Japan Meteorological Agency (JMA) Phone: +81-3-3434-9105 Email: antarctic@met.kishou.go.jp	https://www.jma.go.jp/jma/indexe.html
TJM04	Radiation observation	Global solar radiation, Direct solar radiation, Diffuse solar radiation, Composite global solar radiation, Downward longwave radiation, Downward total radiation, UV-B radiation, Reflected solar radiation Upward longwave radiation, Upward total radiation, Atmospheric turbidity Surface spectral ultraviolet radiation	Syowa	69°00'25"S, 39°35'01"E	○	○	Meteorology	Name: Yutaka Surname: Ogawa Job Title or Position: Head, Office of Antarctic Observation, Atmosphere and Ocean Department, Japan Meteorological Agency (JMA) Phone: +81-3-3434-9105 Email: antarctic@met.kishou.go.jp	https://www.jma.go.jp/jma/indexe.html
TJM05	Weather analysis	Weather Conditions	Syowa	69°00'25"S, 39°35'01"E	○	○	Meteorology	Name: Yutaka Surname: Ogawa Job Title or Position: Head, Office of Antarctic Observation, Atmosphere and Ocean Department, Japan Meteorological Agency (JMA) Phone: +81-3-3434-9105 Email: antarctic@met.kishou.go.jp	https://www.jma.go.jp/jma/indexe.html
TJM06	Another observation	Automatic Weather Station observation	Syowa	69°00'25"S, 39°35'01"E	○	○	Meteorology	Name: Yutaka Surname: Ogawa Job Title or Position: Head, Office of Antarctic Observation, Atmosphere and Ocean Department, Japan Meteorological Agency (JMA) Phone: +81-3-3434-9105 Email: antarctic@met.kishou.go.jp	https://www.jma.go.jp/jma/indexe.html
TN01	Ionospheric observations	Ionospheric vertical sounding, GPS scintillarion monitoring/ Ionosphere data were reported as Ionospheric Data at Syowa Station (Antarctica). In addition, it was released in semi-real time on the website.	Syowa	69°00'25"S, 39°35'01"E	○	○	Earth and atmospheric sciences - other	Name: Hideo Surname: Maeno Job Title or Position: Contract Employee, Space Environment Laboratory, Radio Propagation Research Center, Radio Research Institute, National Institute of Information and Communications Technology (NICT) Phone: +81-42-327-6096 Email: maeno@nict.go.jp	http://wdc.nict.go.jp/IONO/wdc/index.html http://iono-syowa.nict.go.jp/
TN02	Data acquisition for monitoring space weather conditions	Data acquisition of ionospheric vertical sounding, GPS scintillation monitoring, and magnetic field variations Data was referenced for Space Weather Forecast. In addition, it was released in semi-real time on the website.	Syowa	69°00'25"S, 39°35'01"E	○	○	Astrophysics	Name: Hideo Surname: Maeno Job Title or Position: Contract Employee, Space Environment Laboratory, Radio Propagation Research Center, Radio Research Institute, National Institute of Information and Communications Technology (NICT) Phone: +81-42-327-6096 Email: maeno@nict.go.jp	http://iono-syowa.nict.go.jp/ http://swc.nict.go.jp/en/
	Others								
AAK0901	Deployment of drifting buoys requested from Australian Bureau of Meteorology	Ten surface drifting buoys have been deployed from the icebreaker Shirase in response to the request of the Australian Bureau of Meteorology. Location and sea surface data for each buoy have been transmitting via satellite system.	Along cruise track of R/V Shirase		○		Meteorology	Name: Joel Surname: Cabrie Job Title or Position: Team Leader, Marine Networks, Bureau of Meteorology, Australia Phone: +61 3 9669 4651	
AAK0902	Deployment of Argo floats requested from JAMSTEC	Two profiling floats have been deployed from the icebreaker Shirase in the Southern Ocean. Temperature and salinity profiles data measured by floats have been transmitting via satellite system.	Along cruise track of R/V Shirase		○		Oceanography	Name: Shigeki Surname: Hosoda Job Title or Position: Group Leader, JAMSTEC Phone: +81-46-867-9456 Email: hosodas@jamstec.go.jp	

2020/2021 Annual Report - Research Rocket

Table 1

2.2 Operational information

2.2.1 National Expeditions

D. Research Rockets

Location Launch	Date/Period/Frequency	Direction	Max. Altitude	Impact Area	Type	Specifications	Purpose	Project Title/Number
Syowa	Twice daily, throughout the year	All directions, depending on wind	30,000 m	Within a radius of 200-300 km from the site	Rubber balloon	Radiosonde	Aerological observation	Meteorological observations
Syowa	1 to 2 times a week, throughout the year	All directions, depending on wind	30,000 m	Within a radius of 200-300 km from the site	Rubber balloon	ECC (Electrochemical Concentration Cell) Type Ozone sonde	Ozone vertical profile measurement	Meteorological observations
Syowa	4 to 5 times, throughout the year	All directions, depending on wind	28,000 m	Within a radius of 200-300 km from the site	Rubber balloon	CFH (Cryogenic Frostpoint Hygrometer) Type Water vapor sonde	Water vapor vertical profile measurement	Advanced balloon-borne observations of the Antarctic upper troposphere and lower stratosphere (UTLS)
Syowa	A few times, throughout the year	All directions, depending on wind	30,000 m	Within a radius of 200-300 km from the site	Rubber balloon	Radiosonde and Temperature reference sonde	High-resolution temperature measurement	A study on the global atmosphere system based on high-resolution observations of the Antarctic atmosphere
Syowa	Appropriately throughout the winter	All directions, the vicinity of the site	500m	The vicinity of the site	UAV	Multicopter	Aerological observation	Meteorological observations
Syowa	Once in the summer	All directions, the vicinity of the site	40-150m	The vicinity of the site	UAV	Multicopter	Aerial photography	Topographic survey
Lützow-Holm Bay	Once in the summer	All directions, the vicinity of the site	100-500m	The vicinity of the site	UAV	Multicopter	Aerial photography	Topographic survey
Syowa	1 to 2 times a month, throughout the winter except for polar night	All directions, the vicinity of the site	3,000m	The vicinity of the site	UAV	UAV	Aerozols observation	Changing of East Antarctic aerosols in global biogeochemical environment
Higashi-Ongul Island, Langhovde, Akarui-misaki, Skarvsnes, Skallen, Rundvagshetta, Padda Island	Before and after blizzards, throughout the winter	All directions, the vicinity of the site	100m	The vicinity of the site	UAV	Multicopter	Aerial photography	Integrated Geodetic monitoring observation
Syowa	Once a month, throughout the winter	All directions, the vicinity of the site	100m	The vicinity of the site	UAV	Multicopter	Aerial photography	A study on the global atmosphere system based on high-resolution observations of the Antarctic atmosphere
Syowa	Once a month, throughout the summer Once a month after blizzards, through the winter	All directions, the vicinity of the site	20m	The vicinity of the site	UAV	Multicopter	Aerial photography	Multi purpose receiving antenna radome maintenance
Syowa/ R/V shirase	5 to 10 times in the summer 1 to 2 times in the winter	All directions, the vicinity of the site	100m	The vicinity of the site	UAV	Multicopter	Aerial photography	Public relations