

Ny-Ålesund 20-meter Antenna

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Abstract

For the year 2009, the 20-meter VLBI antenna at the Geodetic Observatory, Ny-Ålesund, has participated in VLBI experiments, observing 78 of 80 scheduled 24-hour experiments and 42 of 44 scheduled Intensives. Reasons for the lost experiments were encoder problems and loss of Internet connection. Several experiments during February had to be run with a warm receiver due to a combination of bad weather and compressor problems. In 2009, Ny-Ålesund was a three-person station with Ole Bjørn Årdal as station commander working full time, and Carl Petter Nielsen and Geir Mathiassen working 75% as engineers. In August Moritz Sieber became the third engineer also working 75%. Ole Bjørn Årdal decided to end his employment with the NMA just before Christmas. The new base commander will be Carl Petter Nielsen, and a new engineer will hopefully start early in 2010. Ny-Ålesund is a Mark 5A station.

1. General Information

The Geodetic Observatory of the Norwegian Mapping Authority (NMA) is situated at 78.94 N and 11.87 W in Ny-Ålesund, in Kings Bay, at the west side of the island of Spitsbergen. This is the biggest island in the Svalbard archipelago. In 2009, Ny-Ålesund was scheduled for 80 24-hour VLBI experiments, including R1, R4, EURO, RD, T2, and RDV sessions, and 44 Intensives within the INT3 program. Four experiments had to be cancelled because of station problems. Original problems were encoder and loss of network. Then bad weather conditions before, during, or after repair, making it impossible to work outdoors, often prolonged the downtime period.

In addition to the 20-meter VLBI antenna, the Geodetic Observatory has two GPS antennas in the IGS system and a Superconducting Gravimeter in the Global Geodynamics Project (GGP) installed at the site. There is also a CHAMP GPS and a SATREF (dGPS) installation at the station. At the French-German research station in Ny-Ålesund, there is a DORIS station. In October 2004, a GISTM (GPS Ionospheric Scintillation and TEC Monitor) receiver was installed at the Statens Kartverk structure in the frame of ISACCO, an Italian research project on ionospheric scintillation observations, led by Giorgiana De Franceschi of the Italian Institute of Volcanology and Geophysics (INGV).

2. Component Description

The antenna is intended for geodetic use and is designed for receiving in S-band and X-band. Ny-Ålesund is a Mark 5A-only station. The station configuration file can be found on the IVS Web site: <ftp://ivsc.gsfc.nasa.gov/pub/config/ns/nyales.config>. Ny-Ålesund's close proximity to the North Pole means that the sun is below the horizon from the 23rd of October until the 22nd of February and is above the horizon from 20th April to 27th August. It also means that the station has a large number of circumpolar sources and is situated underneath the auroral oval between 06:00 and 13:00.

3. Staff

Ole Bjørn Årdal was the station commander during 2009 and ended his employment at the end of the year. Carl Petter Nielsen and Geir Mathiassen both have a 3-year part-time contract as engineers. They will work three months followed by one month of leave. In August Moritz Sieber was employed as a part time engineer.

Table 1. Staff related to VLBI operations at Ny-Ålesund. All e-mail addresses are @statkart.no; phone numbers are prefixed in Hønefoss with +47-321- and in Ny-Ålesund with +47-7902-.

Location	Function	Name	e-mail	phone
Hønefoss	Section manager	Line Langkaas	line.langkaas	18434
Ny-Ålesund	Station commander	Ole Bjørn Årdal	ole-bjorn.ardal	
	Engineers	Geir Mathiassen	geir.mathiassen	7010
		Carl Petter Nielsen	carl-petter.nielsen	
		Moritz Sieber (2009.08–)	moritz.sieber	



Figure 1. Ny-Ålesund geodetic observatory, staff (Moritz Sieber, Carl Petter Nielsen, and Geir Mathiassen) and antenna, seen from the west.

4. Current Status and Activities

Ny-Ålesund participated in the scheduled VLBI experiments. During 2009 e-VLBI was used for transferring R1 and INT3 measurements from Ny-Ålesund to the Bonn correlator.

The Superconducting Gravimeter (SCG) placed on the same foundation as IGS-GPS NYA1 has been running without problems. The annual service on the system was performed by Ove

Omang and Carl Petter Nielsen at the end of September. National Astronomical Observatory of Japan, Mizusawa VERA Observatory, which owns the SCG, lent this equipment to NMA starting 2007.04.01, to continue the scientific measurement series.

A consultant checked the indoor climate and found it satisfactory after the repair in 2008. Some adjustments were done to the roof to stop a minor leakage.

Ed Himwich, Brian Corey, and Rich Strand visited the station in July to educate the new staff and monitor the development of the station. The new Field System computers were installed.

Rüdiger Haas and Sten Bergstrand visited the station in late June and set up a system for monitoring the local movements in the ground.

In connection with an application for the financing of two new antennas, a radar profile of ground conditions near by has been made with a ground radar borrowed from The University Centre in Svalbard (UNIS). Based on this background, a decision to drill a number of holes at some locations was made. The purpose of this is to establish the ground condition for possible antenna sites. As soon as the ground freezes and is covered with snow, Kings Bay will start the drilling.

5. Future Plans

Ny-Ålesund will continue to participate in 83 regular and 45 Intensive experiments for which the antenna is scheduled. Carl Petter Nielsen will be the station commander from the 1st of February, and Lars Karvonen will start as a new engineer on the same date. Our hope is that the application for two new antennas will come through, in which case some work with planning and road construction will start. If not, a new and improved application will be made, with some involvement of the station staff.

To reduce loss of energy, the insulation in the roof of the observatory has to be improved. This will hopefully happen during the summer of 2010. Painting of the observatory and some other buildings is planned as well.