

Ny-Ålesund 20 Metre Antenna

Helge Digre

Abstract

For the year 2006, the 20-meter VLBI antenna at the Geodetic Observatory, Ny-Ålesund has participated in VLBI experiments at the scheduled level. Ny-Ålesund also participated in a test of e-VLBI, transferring experiment data from Ny-Ålesund to Haystack. In December, Ny-Ålesund also participated in 3 e-VLBI Intensives. In 2006, Ny-Ålesund felt the consequences of the reduction in maintenance and the lack of operator presence, both caused by the reduction in staff that came as a result of the general reduction in the Norwegian Mapping Authority's (NMA) budgets. For 2006, Ny-Ålesund was a one-person-only station until July 2006. In July 2006 a second operator, Jan-Ivar Tangen, was employed and started his training. Sick-leave from mid-September to the end of November again forced the observatory to operate as a one-manned station. Maintenance and repair have been done at a minimum level, given the personnel situation. No alarms are signed for and no errors are corrected during unmanned operation.

1. General Information

The Geodetic Observatory of the Norwegian Mapping Authority (NMA) at 78.9 N and 11.87 W is located in Ny-Ålesund, in Kings Bay at the west side of the island of Spitsbergen, the biggest island in the Svalbard archipelago. In 2006, Ny-Ålesund was scheduled for 67 VLBI experiments within R1, EURO, RD and RDV. In addition, R4212, R5251, I06354, I06355 and I06356 were done as extras. For 2006, Ny-Ålesund was moved from running weekly R4s to weekly R1s. Nine experiments were cancelled because of systems being down. For the same reason, one experiment ran only 13 hours. Four experiments lost up to 15 hours observing time due to alarms during unmanned operation. Two experiments were ended early and up to 6 hours observing time was lost because of installation of e-VLBI equipment. Some 360 ° turns caused loss of observations because the Ny-Ålesund config-file was not updated after testing and repairing the azimuth hardware end-switches before CONT05. Most of this lost observation time was caused by lack of maintenance and reduction of personnel. In addition to the 20-meter VLBI antenna, the Geodetic Observatory has two GPS antennas in the IGS system and a Super Conducting Gravimeter in the Global Geodynamics Project (GGP) installed on the site. There is also a CHAMP GPS and a SATREF (dGPS) installation at the station. In October 2004 a GISTM (GPS Ionospheric Scintillation and TEC Monitor) receiver was installed at the Statens Kartverk structure in the context 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- and X- band. The equipment is Mark 5. The station configuration file can be found on the IVS web site: <ftp://ivscc.gsfc.nasa.gov/pub/config/ns/nyales.config>. Ny-Ålesund is located so far north that it has daytime aurora in winter and midnight sun from 20th of April to 27th of August. The location of the antenna enables signal reception over the North Pole. In 1998, Ny-Ålesund was the only antenna that could receive signals from the Mars Global Surveyor for 24 hours.

3. Staff

Table 1. Staff related to VLBI operations at Ny-Ålesund.

Hønefoss:	Section manager:	Rune I. Hanssen
	Station responsible at Hønefoss:	Svein Rekkedal
Ny-Ålesund:	Station commander:	Leif Morten Tangen ¹ / Helge Digre
	Engineer	Jan-Ivar Tangen (since July 3)

There has been no participation at VLBI meetings by any of the staff in Ny-Ålesund.

4. Current Status and Activities

Ny-Ålesund has tried to participate in VLBI experiments at the scheduled level, and has done so, mostly as a tag-along station. Ny-Ålesund is a Mark 5A only station. Both the FS and Mark 5 were upgraded to the latest software versions. Two new FS computers were bought last year. Still some modifications and testing have to be done before they can be used permanently for experiments. Two new communication cards have recently been ordered. A direct high-speed data link from Ny-Ålesund Geodetic Observatory to MIT Haystack has been tested from January to August. The high-speed data link was supposed to be able to transfer 100 Mbps. Technical problems for the supplier on Svalbard for the link from Ny-Ålesund to Longyearbyen has reduced the maximum capacity to 85 Mbps in the test period. The Ny-Ålesund high-speed data-link project is a cooperative effort between UNINETT, NORDUnet, NASA Goddard Space Flight Center, MIT Haystack Observatory and NMA. The responsible person at NMA is Rune I. Hanssen.

The Super Conducting Gravimeter (SCG) (placed on the same fundament as IGS-GPS NYA1), has been running without problems. The yearly service on the system was performed by Professor Tadahiro Sato and Dr. Yoshiaki Tamura in the middle of August. National Astronomical Observatory of Japan, Mizusawa VERA Observatory, who owns the SCG, will lend this equipment to NMA from 2007.04.01, to keep the recording of the data going. The Geodetic Observatory, Ny-Ålesund, operated as a one-manned, Mark 5 only, station in the first half of 2006. The second half of 2006 was meant to be a two-manned station, but because of sick leave from mid-September to the end of November, it was operated by only one man.

5. Future Plans

Ny-Ålesund will continue to participate in the experiments the antenna is scheduled for, and will try to do as many experiments as possible, given the maintenance and personnel situation at the station.

NMA will hire a third person for Ny-Ålesund in 2007, and we hope to have 3 persons early in 2007. Until then, the experiments will continue to run unmanned during nights.

The tests with e-VLBI will continue, most likely with main interest on Intensives. The new Field

¹Leif Morten Tangen is on leave of absence from 2006.11.01 until 2008.03.01.

System computers will hopefully be set to permanent use early next year. National Astronomical Observatory of Japan—Mizusawa VERA Observatory—will lend Norwegian Mapping Authority their superconducting gravimeter (already installed at Ny-Ålesund) from 01.04.2007 onward, so the scientific measuring series will continue.