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Deformation studies at Ny-Aalesund, Svalbard

H. P. Kierulf (1) and O. Kristiansen (1)

(1) Norwegian Mapping Authority, Geodetic Institute, NO-3507 Hoenefoss (halfdan.kierulf@statkart.no)

The need for fundamental geodetic stations, as the Space-Geodetic Observatory at Ny-Aalesund, Svalbard, is crucial in maintaining the stability of global terrestrial reference frames. The geodetic infrastructure at the observatory includes a 20-m VLBI antenna, several GPS receivers, a tide gauge, a super-conducting gravimeter and a co-located DORIS station. Repeated absolute gravity measurements complement the observations.

In order to study the stability of the Kings Bay area in Svalbard, a GPS control network was established in 1998 extending in east-west and north-south directions approximately 50 km by 30 km. Several GPS campaigns have been carried out from 1998 to 2005. The data from these campaigns are compared with the neo-tectonic activity in the area.

A permanent GPS receiver was mounted in 1991 and an additional permanent GPS receiver was installed in 1997. A comprehensive comparison between the GPS determined three-dimensional velocities from both receivers; VLBI velocities and published ITRF velocities will be presented.