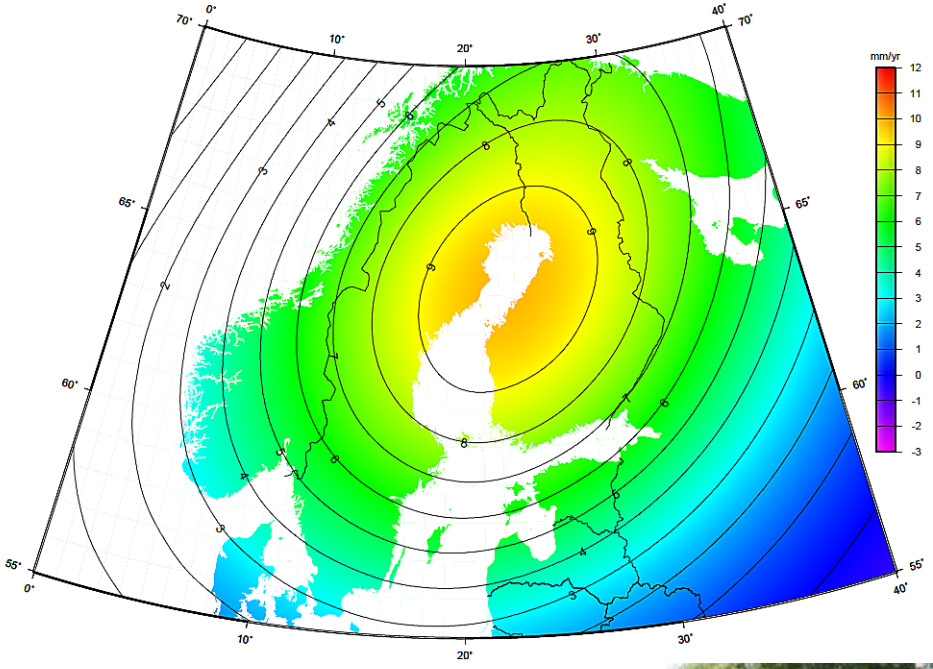
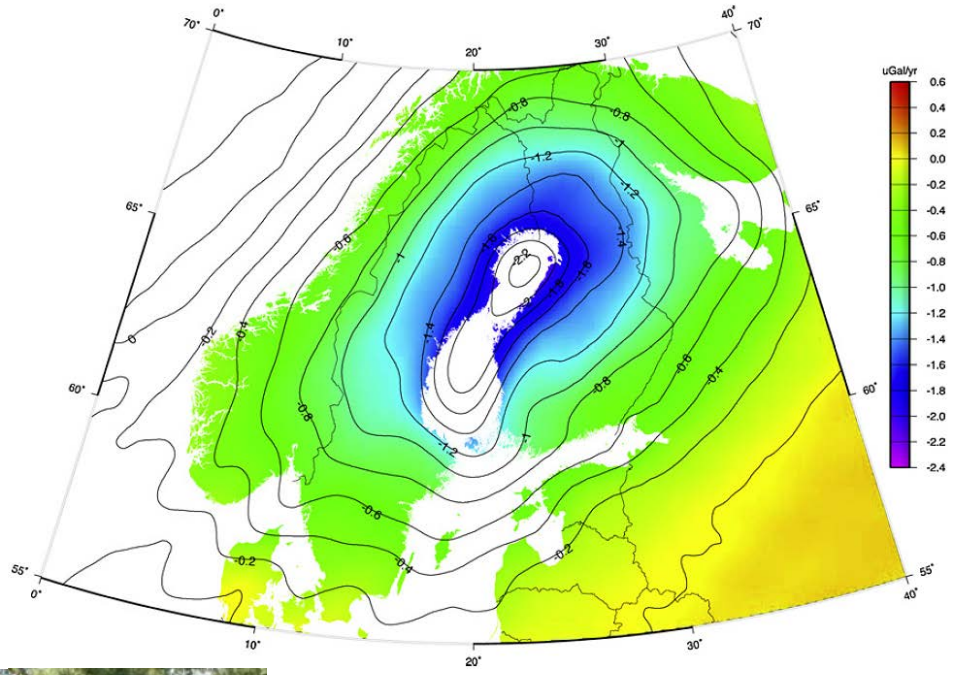


Land uplift
(model fit to GNSS obs.)



Gravity change
(same model)

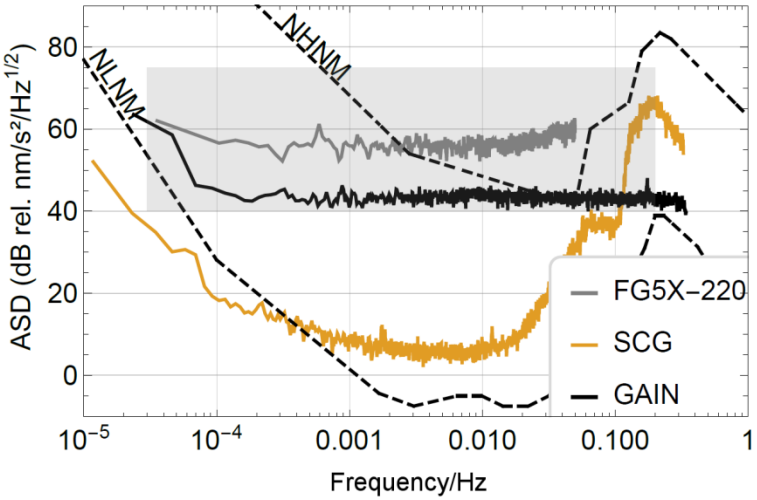
Gravimetry in the service of Glacial Isostatic Adjustment

NKG Working Group for Geodynamics coordinates re-observation at 20+ sites with **A**bsolute **G**ravimeters.

Onsala, equipped with a **S**uper**C**onducting **G**ravimeter serves as a station for observation, instrument intercomparison, and reference.

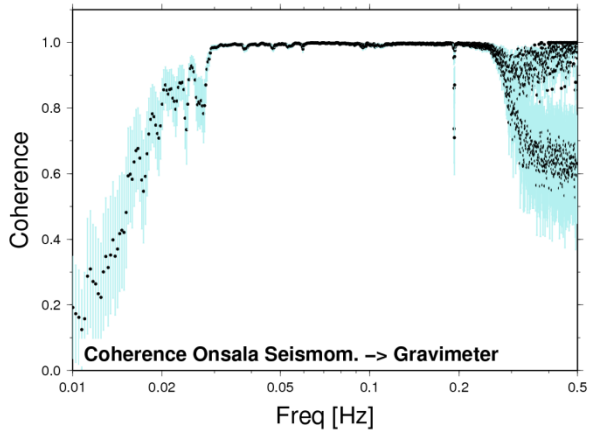
A short history

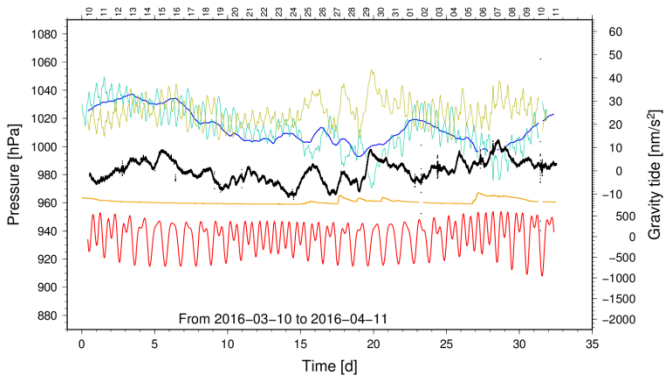
June 2009: SCG installation
GWR-054
Data efficiency: 99.8%
(despite two repairs)
Nine AG campaigns 2009-2015
(Lantmäteriet, Leibniz University Hannover, Humboldt-University Berlin)
February 2015: Test site for Quantum Gravimeter (GAIN, Humboldt)



Site characteristics

Station situated on crystalline bedrock, groundwater variations benign and under control
Thermally insulated
Temp-sensors in monument
Two platforms for visiting AG's
Short-latency data and monitor freely available on Internet http
Complementary: SNSN broadband seismometer (Uppsala University); Met station and mareograph (OSO)





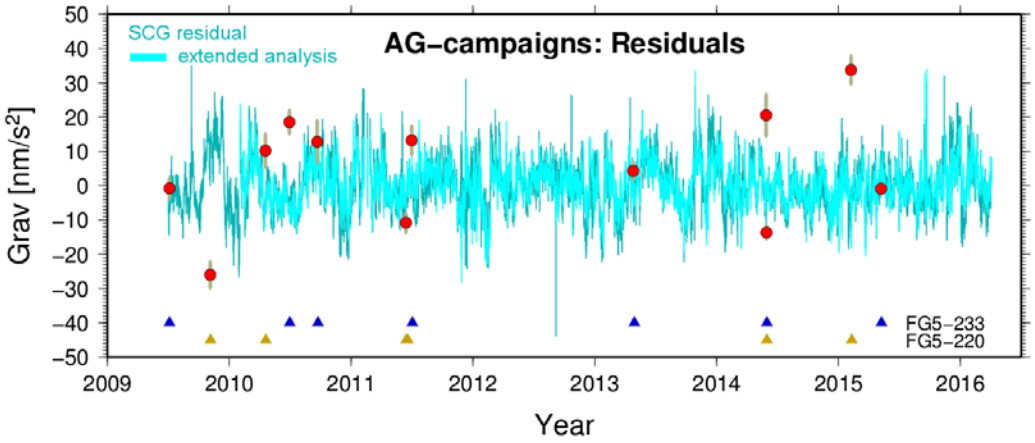
Tidal range:	1 500 nm/s²
AG repeatability:	±20 nm/s²
SCG residual RMS:	7 nm/s²

SCG main advantage for AG:

Provides a highly precise model for tides and atmosphere.

Replaces AG campaign reduction (to arrive at a mean *g*).

Data processing at single-drop level.



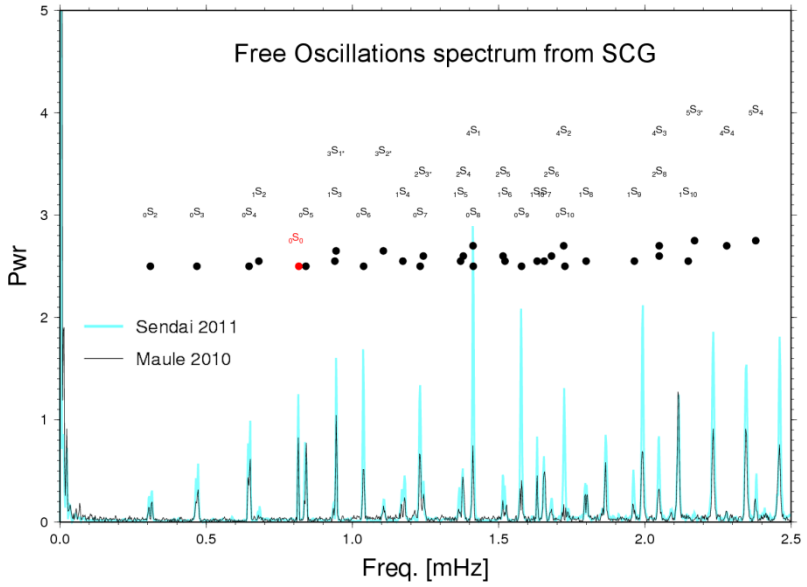
The SCG is not an absolute instrument (drift; no direct relation to SI units).

However, we understand the *g*-variations at the level of 7 nm/s² RMS; and this remainder bears mainly spectral signatures reminiscent of atmospheric and sea level variations.

=> stationarity is a limiting assumption, despite the dynamic effects in our **extended analysis**.

The AG residuals shown remain after estimation of platform ties, meter-to-meter offset, and north-to-south orientation offset.

Seismometer – Absolute gravimeter – – Superconducting gravimeter – Seismometer



The SCG is an extreme-wideband seismometer. It senses the free oscillations of the earth after great earthquakes with the lowest frequencies, ${}_0S_2$ ${}_0S_3$ …

Periods of high microseismic back-ground cause additional scatter in AG-drop series. The noise can be reduced to a normal level using the SNSN seismometer at Onsala.