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Renewal of the Finnish calibration line for relative gravimeters

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Introduction

The FGI houses the National Standards Laboratory for Free-Fall Acceleration

The Finnish gravity standard is the absolute gravimeter FG5X-221

The laboratory offers:

- Gravity value determination
- Laboratory space for comparisons of absolute gravimeters
- Masala-Vihti calibration line for relative gravimeters

1.5.2022 FGI moved to Otaniemi campus in Espoo:

Renewal of the calibration line needed!

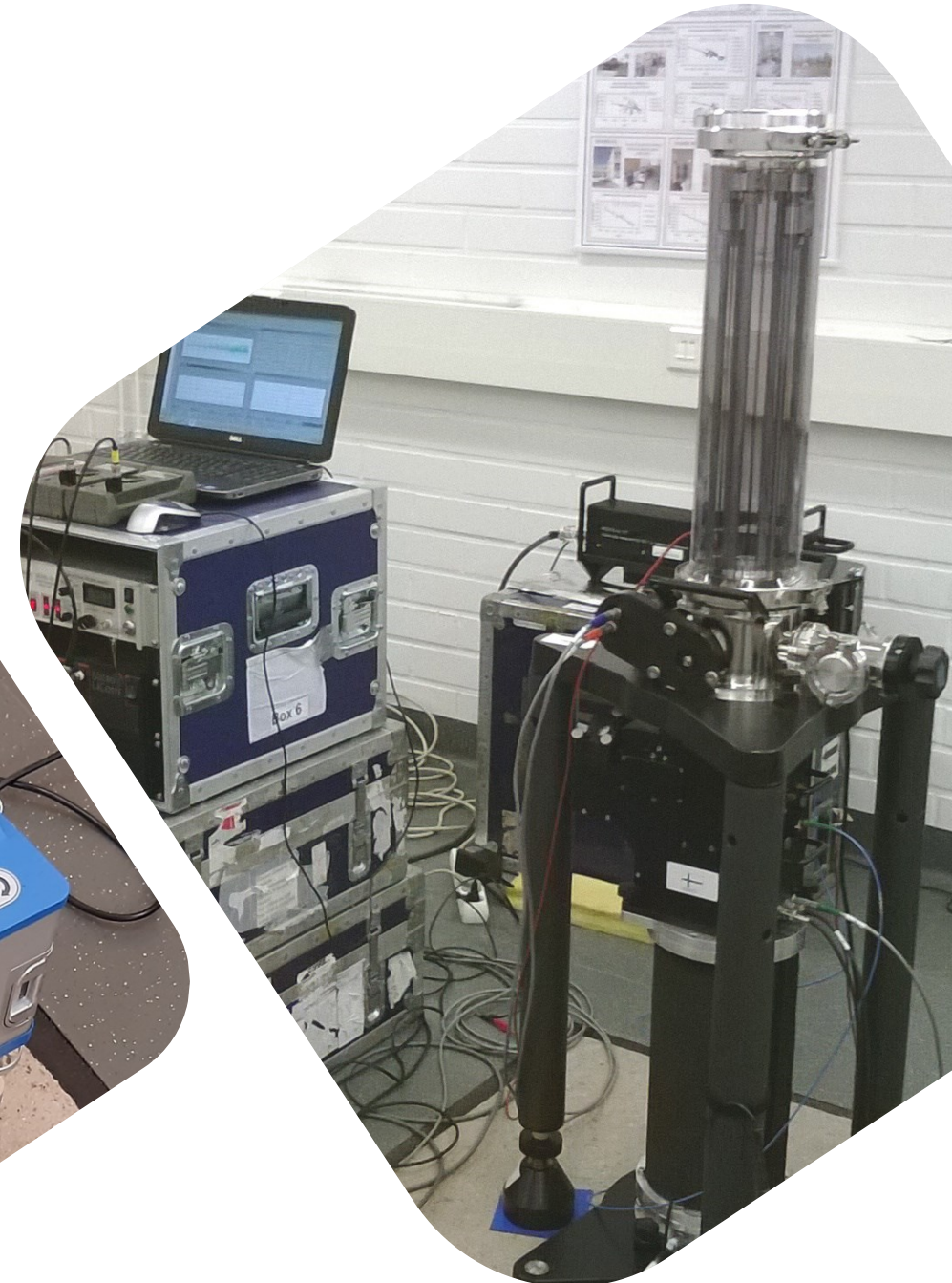


Quality Manual
for the National Standard
in the Finnish Geospatial
of the National Land Survey
Maanmittauslaitoksen Pa
Kansallisten mittanorma

NLS FGI-GEOGEO NSL

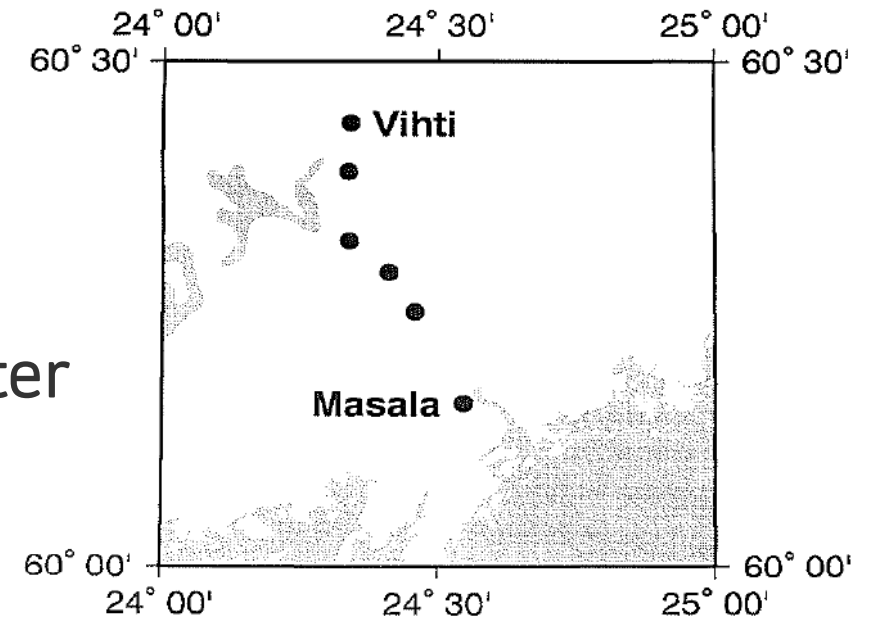
Contents

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Masala-Vihti calibration line

- Established in 1997 (after the FGI had moved)
- Total length 40 km, ~30 min. drive by car
- $\sim 10 \times 10^{-5} \text{ m/s}^2 \Delta g$ between points
- $\sim 53 \times 10^{-5} \text{ m/s}^2 \Delta g$ between end points
- End points measured with absolute gravimeter
 - At first Masala AA (961002)
 - From 2006 onwards: Masala AB & AC
- In Masala was also on outside point: 971007



Vihti AA (971012)

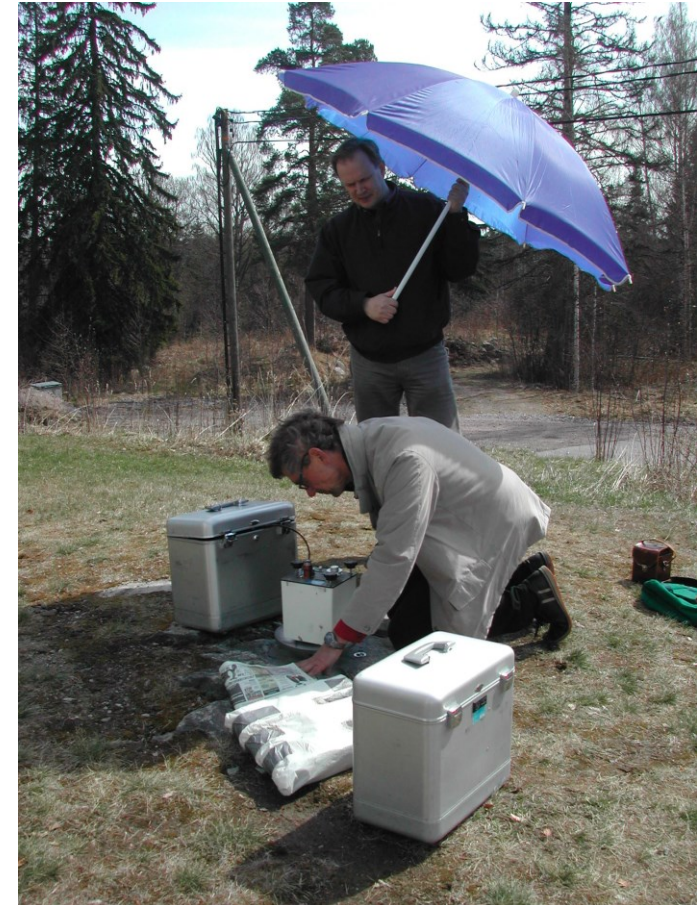
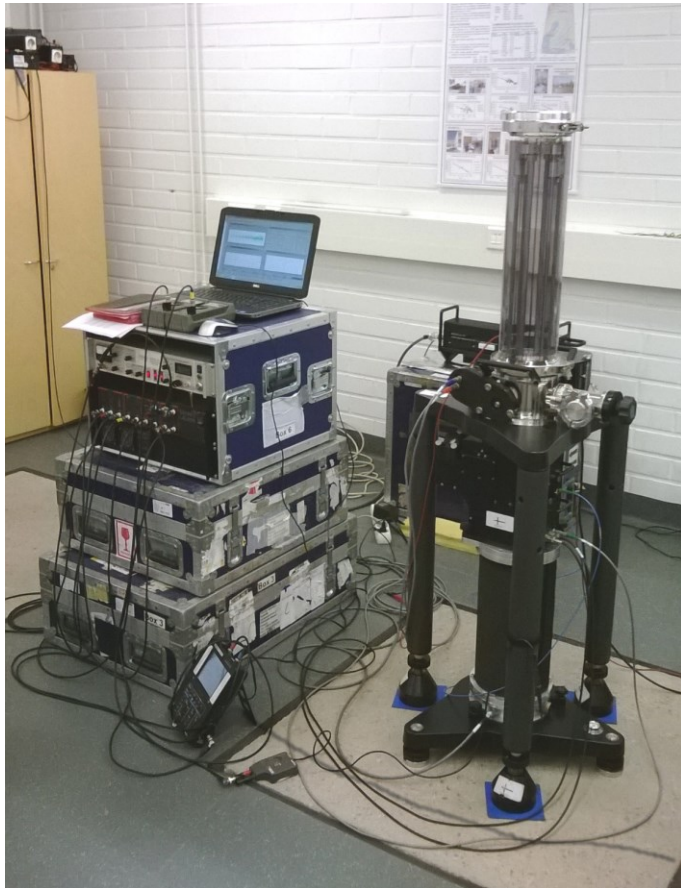


During absolute gravity measurements

During relative measurements



Masala AB (0081002) & AC (0081003) & 971007



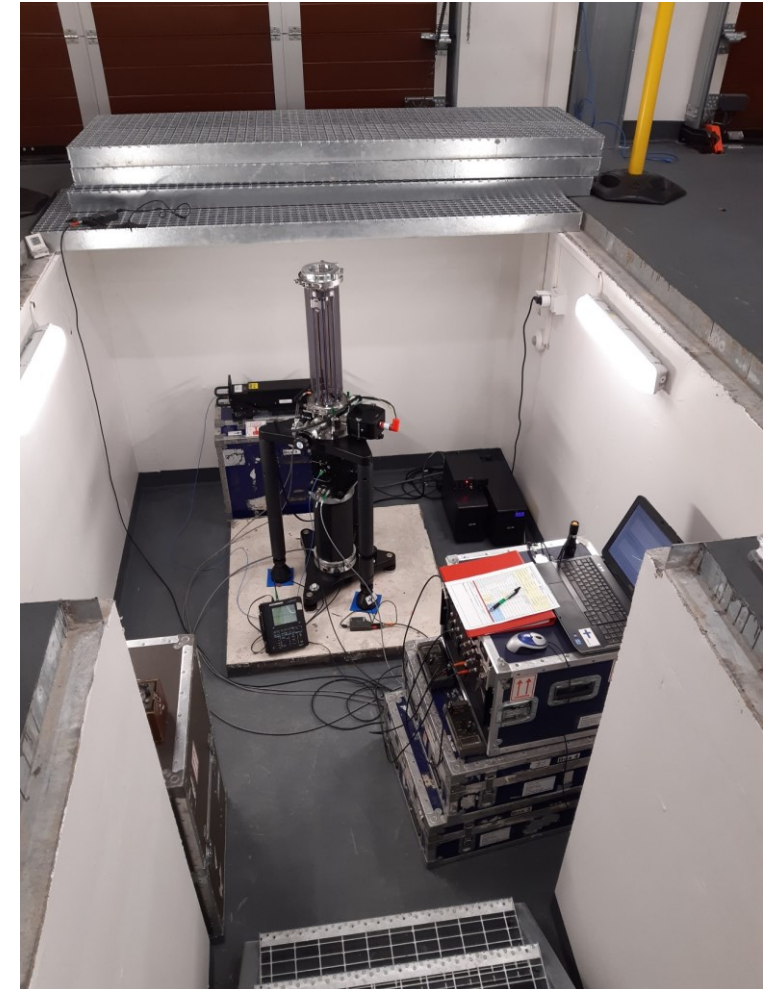
Renewal of the calibration line

- The Masala station moved to Otaniemi: Vuorimiehentie 5
- New station: Otaniemi AA (2022001)
- An additional point (2022002) is established closeby outside
- Station Vihti AA (971012) stays the same
- Relative points (971008, 971009, 971010, 971011) in between the end points stay the same
- If needed an extra relative point is established

New: Otaniemi AA (2022001)



Vuorimiehentie 5



Outdoor point
(2022002) was
established
closeby



Current situation and outlook

In May and June

- Absolute gravity measurements at end points
 - Masala AB & AC (2.5.-6.5.)
 - Vihti AA (9.5.-11.5.)
 - Otaniemi AA (16.5.-18.5.)
- Vertical gradient measurement at Otaniemi AA
- Local tie at Otaniemi
 - AA (2022001) – ulkopiste (2022002)

In August

- Relative measurement between end points with Scintrex CG6
 - Otaniemi (2022002) – Masala (971007) – Vihti (971012)



Outlook

- Measurements certificates and gravity values for Otaniemi AA & Vihti AA (Autumn 2022)
- Gravity value and point card for outdoor point 2022002 (Autumn 2022)
- New gravity values for all points on the line (winter 2022)
- Vision: Gravity values published at new NLS website



Future

- Repeat absolute gravity measurements in Otaniemi AA and Vihti AA in spring 2023
- After that repeat absolute gravity measurements every 5 years
- Masala outdoor point (971007) can be used as long as the point exists until the gravity values of the new point have been released

Questions related to the calibration line or other services of the standards laboratory for free-fall acceleration can be sent to:

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