




Nordic Geodetic Commission Working Group for Height Determination



 THE DANISH NATIONAL SPACE CENTER IS A RESEARCH CENTER
UNDER THE MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION

The Baltic Levelling Ring

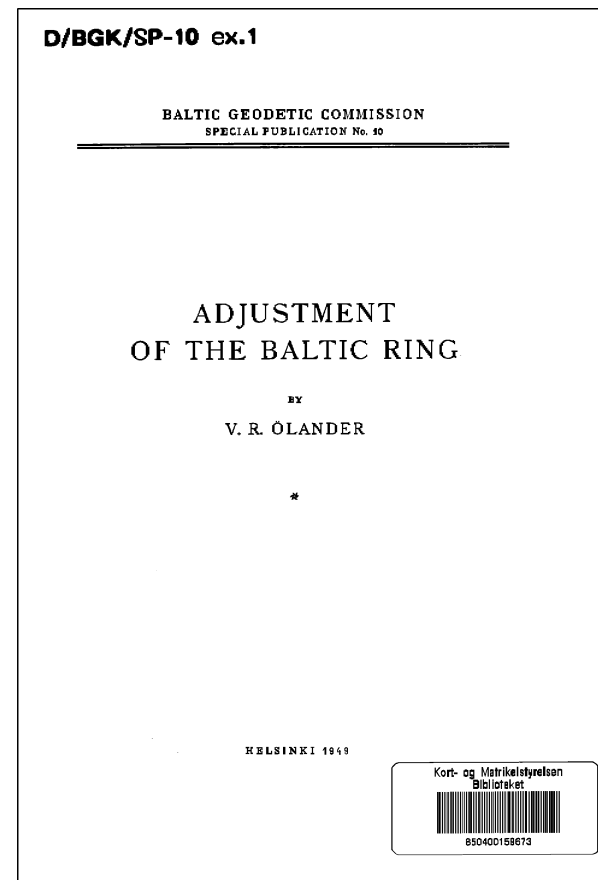
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(1) Danish National Space Center
(3) National Land Survey Sweden

(2) Finnish Geodetic Institute
(4) Norwegian Mapping Authority

History: Baltic Geodetic Commission

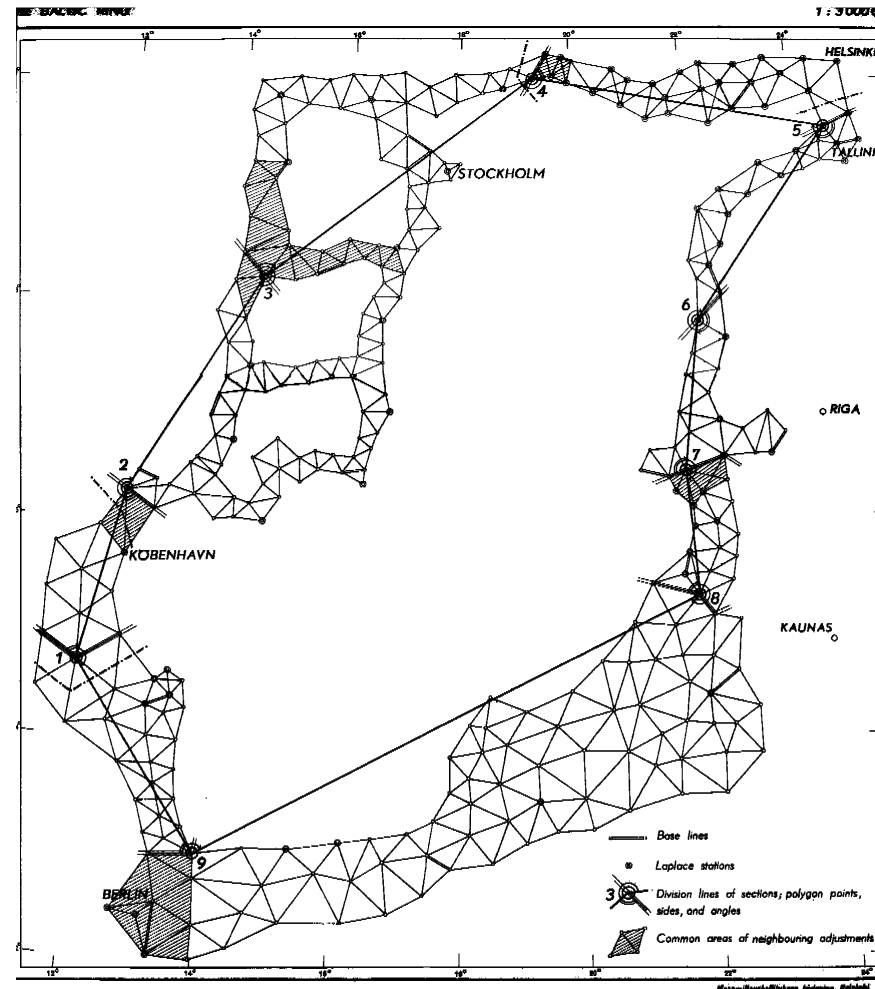
- Founded 1924
- Purpose → →
- Preliminary result 1938
- Publication 1949





History: Baltic Geodetic Commission

Network



The Baltic Levelling Ring

Commission: Adjustment of levelling observations
around the Baltic Sea

BY:

- Fixing the height of Amsterdam Pile
- Adjustment in geopotential units
- In MEAN TIDAL system
- Results presented to epoch 2000.0
- In Normal heights

CONTRIBUTIONS

- Estonia
- Germany
- Latvia
- Lithuania
- Poland
- The Netherlands

UPLIFT MODEL

Apparent to sea level:

- Ekman (GPS, TG, Geophysic)
- Lambeck 2002 (GPS, TG, Geophysic)
- Vestøl 2004 (Repeated Lev, GPS, TG)
- NKG2005LU (Repeated Lev, GPS, TG)

UPLIFT MODEL

A given uplift model will affect the mean error of the observations:

Example: Observations before 1934 in Norway

- Lambeck 2002: mean error $1.61 \text{ mm/km}^{1/2}$
- Vestøl 2004: mean error $1.36 \text{ mm/km}^{1/2}$
- NKG2005LU: mean error $1.55 \text{ mm/km}^{1/2}$

NKG2005LU describes the post glacial uplift rates

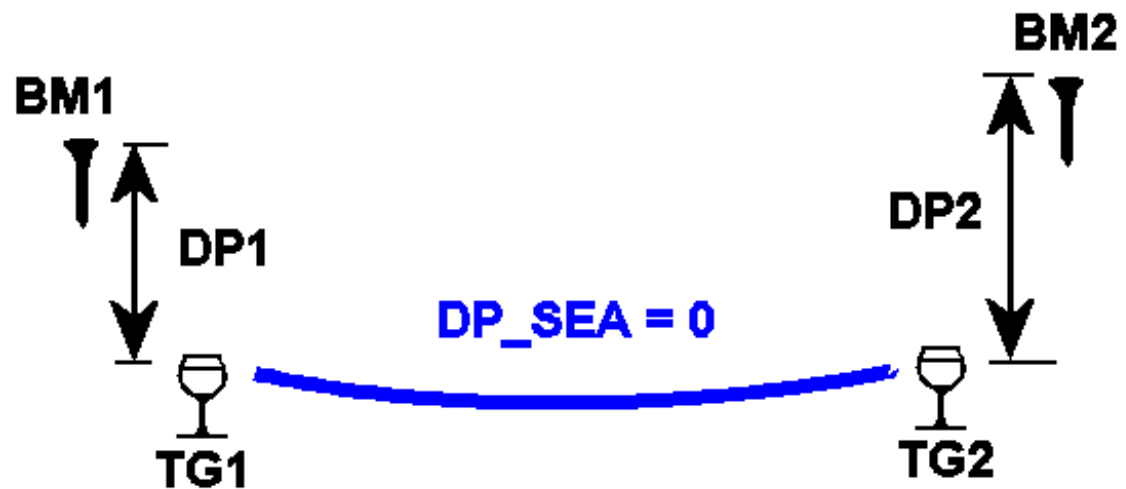


NETWORK



Finnish Gulf

SITUATION ::

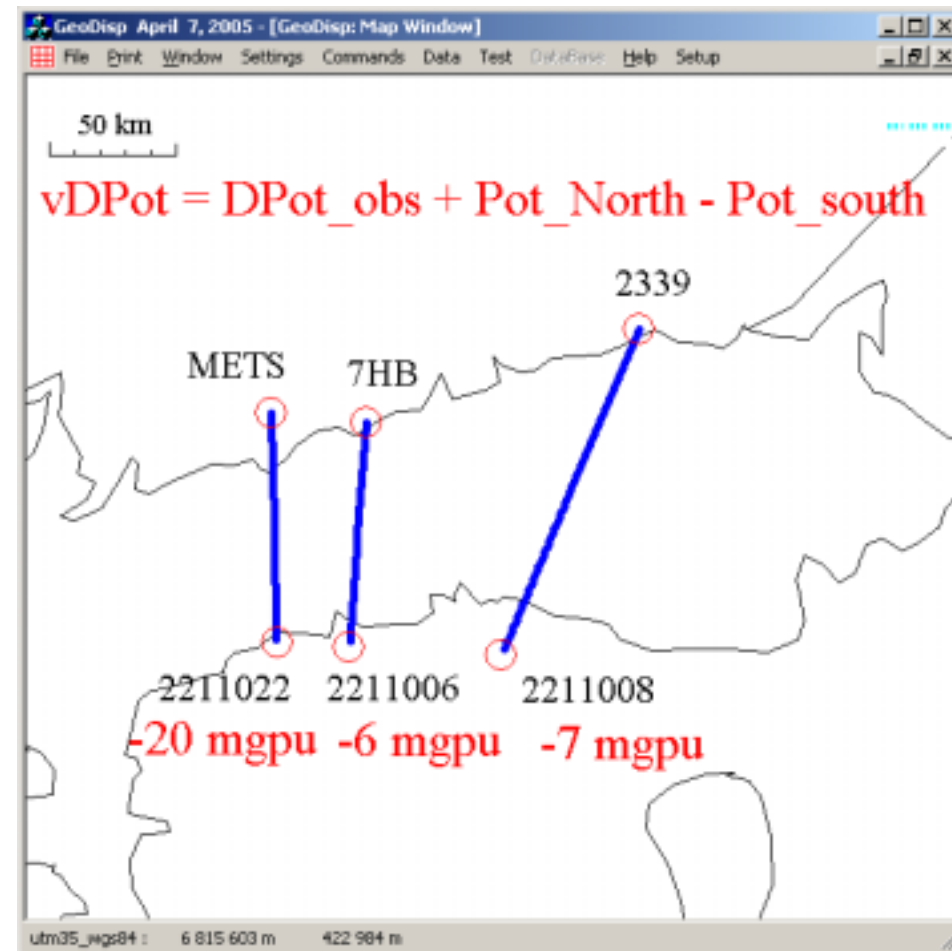


ASUMPTION ::

NO MEAN SEA TOPOGRPHY
MEAN SEA HAVE SAME HEIGT
OVER GEOID AT TG1 AND TG2

CLOSING ERROR

MEAN = 11,3 mgpu
 $\approx 11,5$ mm



TECHNIQUES FAILED

- GPS – levelling
- Altimetry in the Baltic Sea
 - Geoids have errors/low accuracy

OUTLOOK

- NKGRF2003:
 - GPS Campaign 2003.75
 - Intraplate velocities
- BALTIC LEVELLING RING
 - Normal heights to 2000.0
 - Connect GPS stations to the network