Joint adjustment of Nordic leveling networks: Status report

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UELN-95/98 network. Connection over the Danish straits. We use "nonorthodox" connections (1) Across the Aland sea (2) Across the Gulf of Finland

August 2000

Uplift mm/yr relative to MSL (Ekman 1996).



Background

- Finland (2004), Norway (2006), Sweden (2003); Estonia (2005); Latvia (2005), Lithuania (2005) have completed or are about to complete new precision levellings. Denmark recently (2001) adopted the new system DVR90.
- New national height systems
- Treatment of postglacial rebound
- Tie around the Baltic to the main body of the UELN, test adjustments of the Baltic Ring
- Co-operation of Nordic Geodetic Commission, Working Group for Height Determination and

•UELN Computing Centre, Estonia, Latvia, Lithuania, Poland, Germany, the Netherlands



Differences between UELN heights and national heights in Europe (in cm)

September 2000



EVRF2000 transformations

EVRF2000 misclosure around the Baltic

BK77 heights relative to N60, from EVRF2000 +8 ± 4 cmBK77 heights relative to N60, our ties -3 ± 3 cmmisclosure $+11 \pm 5$ cm

Swedish tidal corr. + Aland sea tie account for 6 cmNet $+5 \pm 5 \text{ cm}$ Uplift mm/yr relative to MSL (Ekman 1996).





Postglacial rebound rates relative to the geoid from the "BIFROST" GIA model by Milne et al. (2001)

Lambeck, Smither, Ekman, Geophys. J. Int. (1998)

Uplift from GIA model relative to MSL in mm/yr





Olav Vestöl (Oct 2004).

Uplift map collocated from repeated precise levelling, tide gauges, permanent **GPS**



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Aland Sea GPS/geoid connection



Salinity in the Baltic (down to the halocline)



1 color zone = 1 % o1 $\% o \approx 1 \text{ cm SST}$

Modified from Atlas of Finland (1986)



Baltic mean SST modelled in mm

from a dynamical model, 5year run by Novotny et al. (2002)



Surface currents (Atlas of Finland, 1986; Palmen, 1930)



MSL at tide gauges along the Gulf of Finland



The red triangles are 1...4 cm \approx 3 ± 2 cm higher

This is approximately the difference between heights in N60 and heights in BK77

