Evaluating SARAL/AltiKa against Cryosat-2 and ENVISAT over inland water bodies

Looking at lakes in Scandinavia

Ole B. Andersen, K. Nielsen, H. Villadsen & A Abulaitijiang L. Stenseng and P. Knudsen

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Overview

- Area
- Accuracy vs Precision.
- Results (SA/C2/Envisat)
 - Vânern (Medium lake)
 - Vâttern (Smaller lake)
 - Arresoe (Very Small Lake)
- Conclusions

• SARAL/AltiKa at Thales in 2009



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Accuracy vs **Precision**



SAR ALTIMETRY TRAINING COURSE 21-22 October 2014 | Lake Constance | Germany

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First lake: Vänern (56000 km2) Cryosat in LRM & SAR)

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LARS retracking System





Range + Geophys corr (wet, dry, iono, Load, solid, pole tide, geoid)

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SARAL Workshop, October 2014, Konstanz, Germany



SARAL/AltiKa (Track 203)

• Ice 1 / Ice 2 retrackers shown

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Range Accuracy

- C2 LRM (10 cm offset)
- Wet Troposphere
- Geoid error?(10 cm).
- C2 Ground Tracks
- S/A Range variations
- Wrt annual signal is
- 10 cm.
- Little higher for C2
- Will investigate tide
- Gauge in lake closer.

Konstanz, Germany

Envisat (relative to Ellipsoid)

Second Lake: Vättern (18000 km2)

- Saral AltiKa Performing Very accurate (Precision (1 Hz = 1 cm))
- Cryosat-2 Descending OK?, Ascending = Instrument Noise.
- Lake Geometry (north/south) is no particularly good for Altimetry......

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Arresø

D.

Groundtrack pattern problematic for C2.

Se more in OSTST presentation by K. Nielsen (Danish Lakes).

Conclusions.

Vânern (medium sized lake) have shown to be very applicable to Evaluation of altimetry (and potential Cal/Val of future satellites)

Range precision of SARAL/AltiKa of 5.5 mm (1 Hz)

SARAL/AltiKa is less prone to land contamination (compared to C2 (both LRM and SAR + Envisat)

Wet troposphere + Geoid error affects the Accuracy

SARAL/AltiKA provides a huge step forward for hydrological monitoring as we can retrieve accurate lake height variations of even VERY SMALL LAKES lakes

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