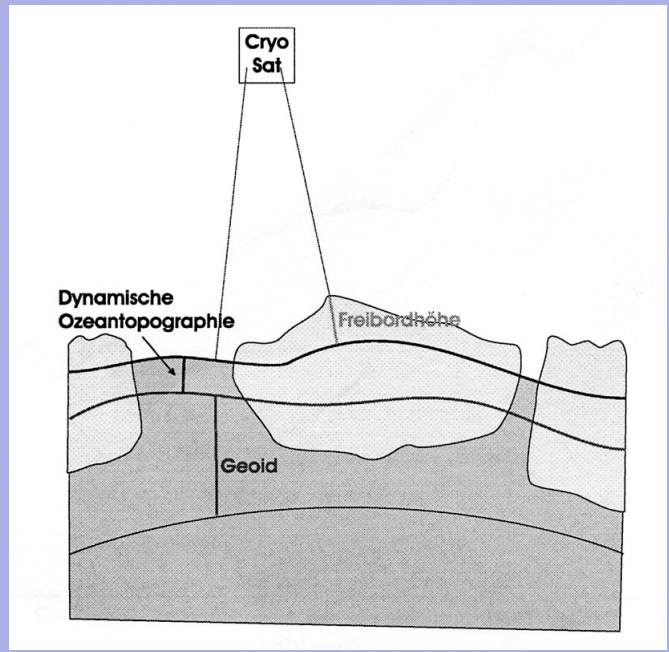
Combining Cryosat and GOCE
at high latitudes

4/5 November Friedrichshafen

Cryosat



Plenty of leads allow 'simultaneous' measurement of SSH and Freebord
success of present day altimetry

Measurements of SSH and Freebord at different times
(crossover, repeat track, inbetween [see contribution by Flury])

All measurements rely on knowledge of snow cover

Measurement principle independent of geoid

Freebord = IceSH (t1, x) – SSH(t2,x)

same location:

$\Delta SSH \quad (t1; t2)$

$\Delta dyntop \quad (t1; t2)$

we will run an ocean model that provides tides and changes in circulation (+ mean?)

different location:

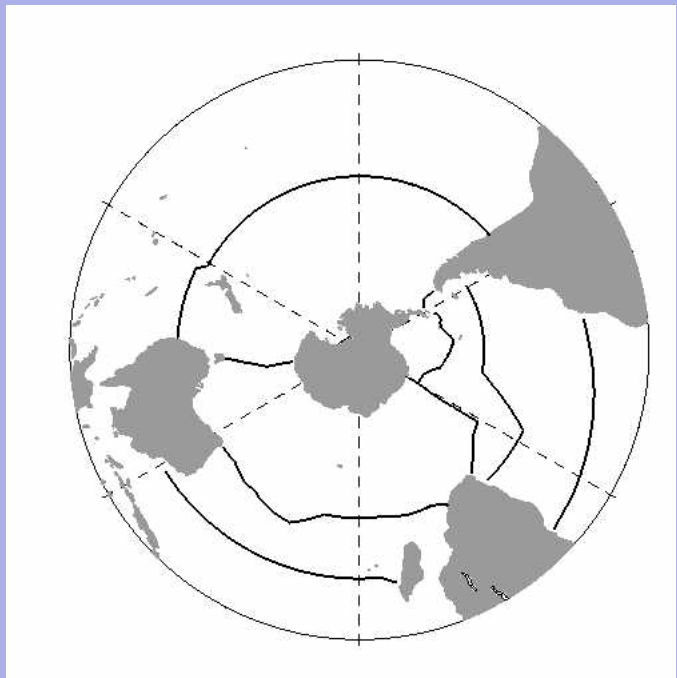
$\Delta dyntop \ (x1; x2)$

$\Delta freebord \ (x1; x2)$

$\Delta N \, (x1; x2)$

Cryosat can measure the geoid

Applications : Antarctica (SO)



- High latitude altimetry in partially sea ice covered areas
- ACC, dynamics and fresh water cycle (sea ice, ice cavities –tidal mixing)
- coastal current with large scale coherent fluctuations

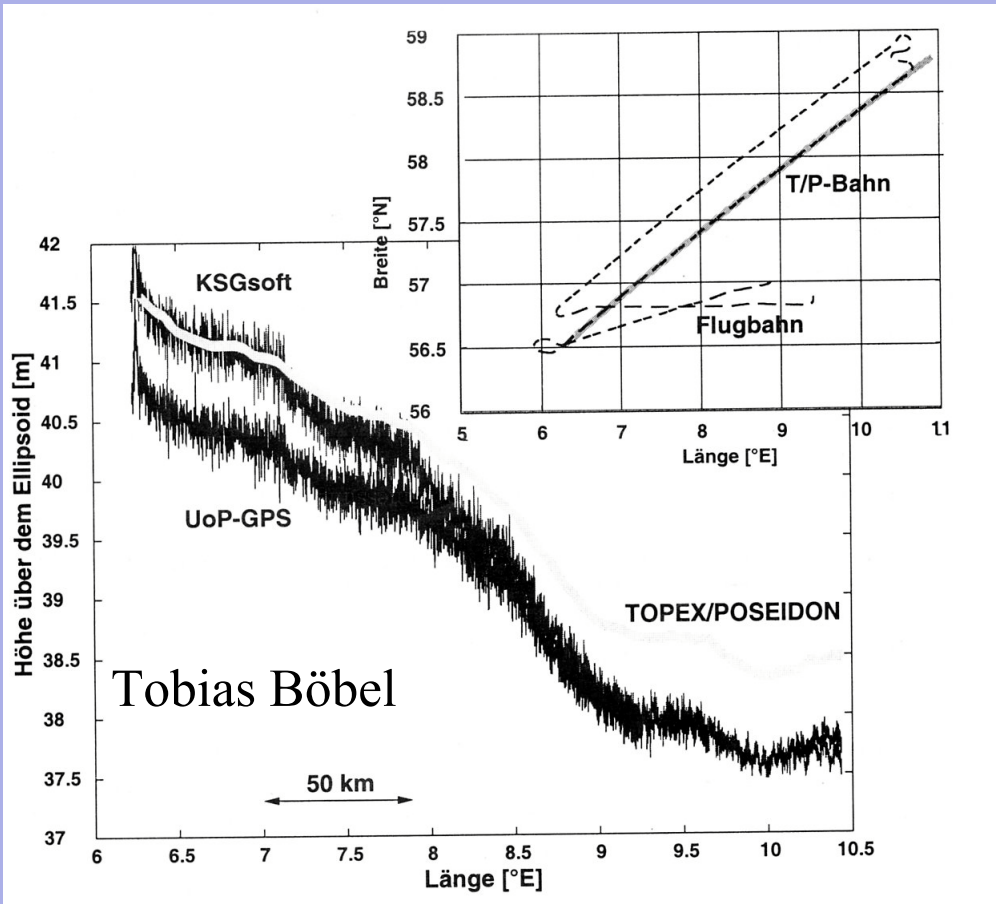
Applications : Arctic ocean

- Improving tidal models (C)
- Improving circulation models (C&G)
- Sea ice prediction model (C, SAR)
  ship routing: open water, ice thickness, ridging

  River flow (C) (which period?)

C: Cryosat, G: GOCE

Airborne measurements



Airborne measurements can provide detail but need larger scale N to avoid trends and biases.

Cryosat and GOCE

- combine favourably at high latitude
- Cryosat supports GOCE for regional N
- Data assimilation must be done scale dependent

- Orbit configuration of Cryosat?
  subcycle is not sufficienty close to repeat orbit.