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Gravity changes in West Greenland  
from  
GOCE Gradient and ground gravity data.





# Gravity Field and Steady-State Ocean Circulation Explorer



Greenland Ice Sheet Seminar 2014

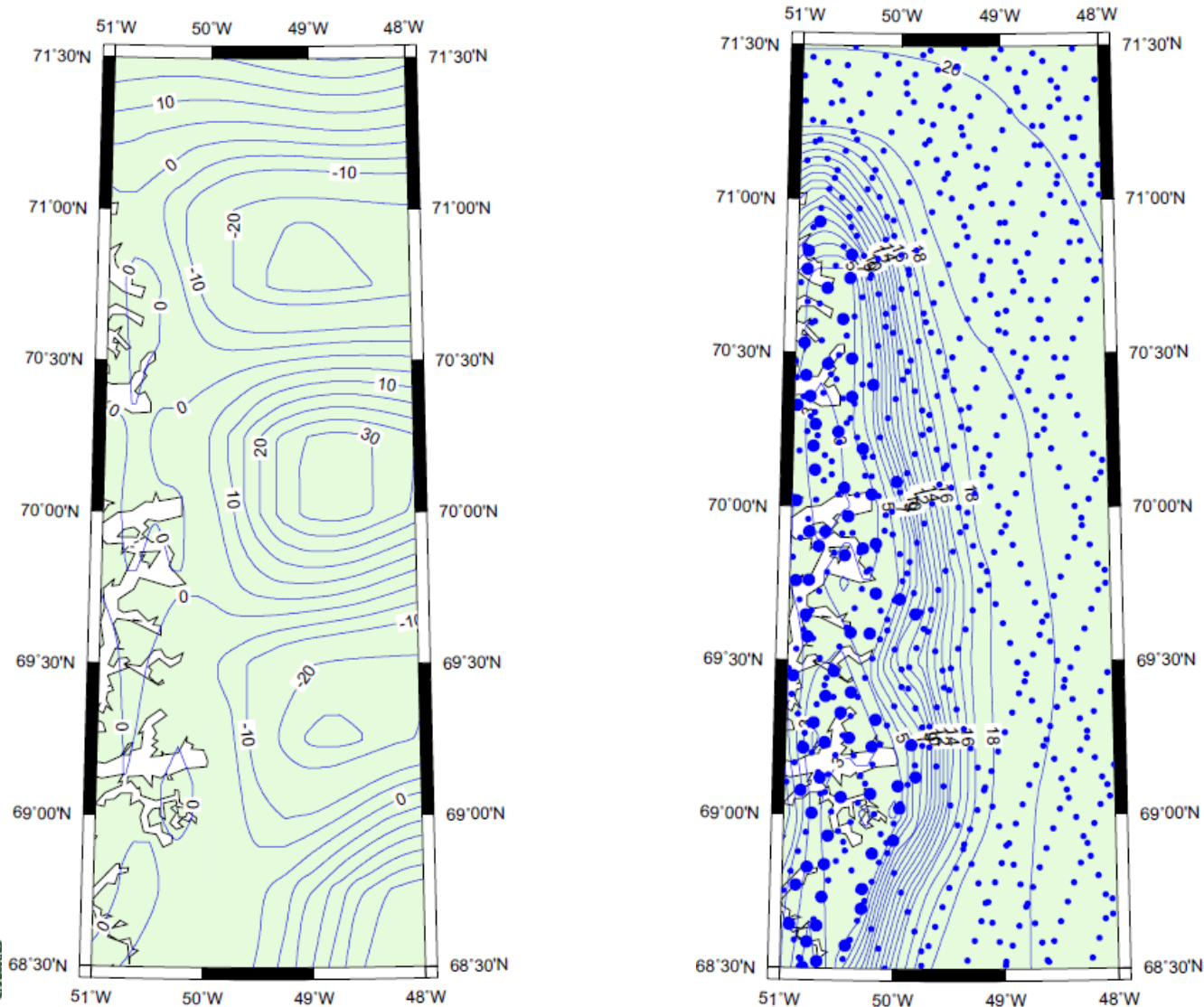
## Global gravity, ground and Airborne data.

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- Old gravity observations at the coast
- Gravity data at GRIP, 1990. (not used)
- Airborne data from 1991/1992
- Global gravity field models  
GRACE,GOCE.
- Gravity computed from GOCE vertical gradient data, Winter 2008, Summer 2012.



# Differences W2009-S2012, and error-estimates, units: mgal.



Small dots:  
GOCE obs.  
Large dots:  
Ground  
gravity



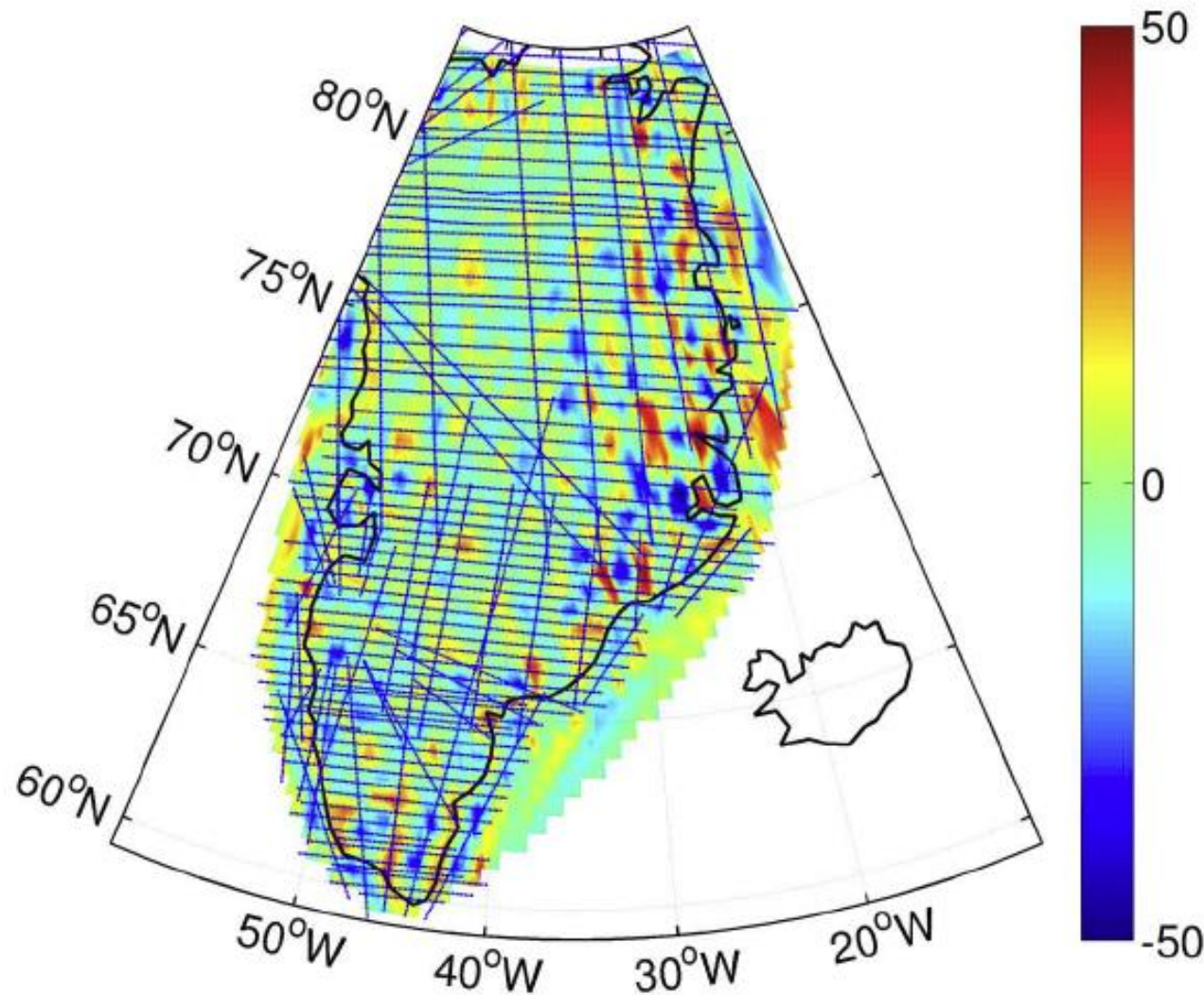
## Comparison and verification of results:

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- Large differences observed,
- But **error** of same magnitude.
  
- **Improvements**: subtract effect of topography/ice to lower signal variance which makes error smaller.
  
- **Compare** with ice changes observed by ATM, CryoVex and PROMICE data (Joanna Levinsen)



Comparison with Airborne gravity and GOCE model (mgal), at 3900 m.



Differences:  
Greenland  
Mean: 2.3  
Stdv.: 12.9  
South-West:  
Mean: 0.15  
Stdv.: 7.14

**NO MASS  
CHANGE  
1992-2012**

