Combining ESA and NASA altimetry over sea ice

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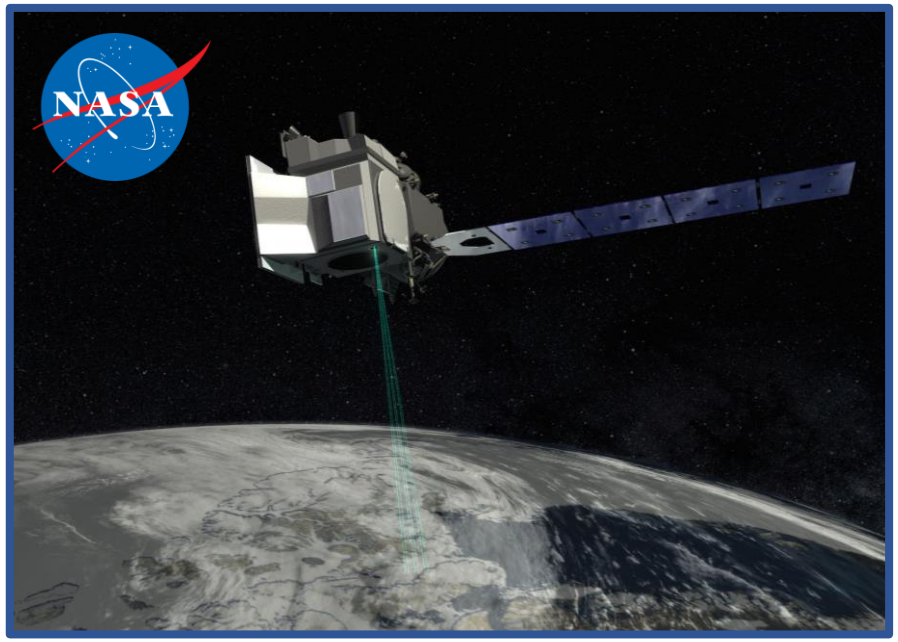
CryoSat-2

- Since October 2010
- Radar altimeter
- 92-degree inclination orbit
- PLF ~1.65 km x 300 m

ICESat-2



- Since September 2018
- Laser altimeter
- 92-degree inclination orbit
- Footprint ~11 m diameter

We now have a unique opportunity to combine radar and laser measurements over the Polar sea ice cover, year-round, up to 88° north and south

Importance of sea ice floe length observations

Modelling

The Cryosphere, 13, 2869–2885, 2019
https://doi.org/10.5194/tc-13-2869-2019

The Cryosphere Open Access EGU

Estimating the sea ice floe size distribution using satellite altimetry: theory, climatology, and model comparison

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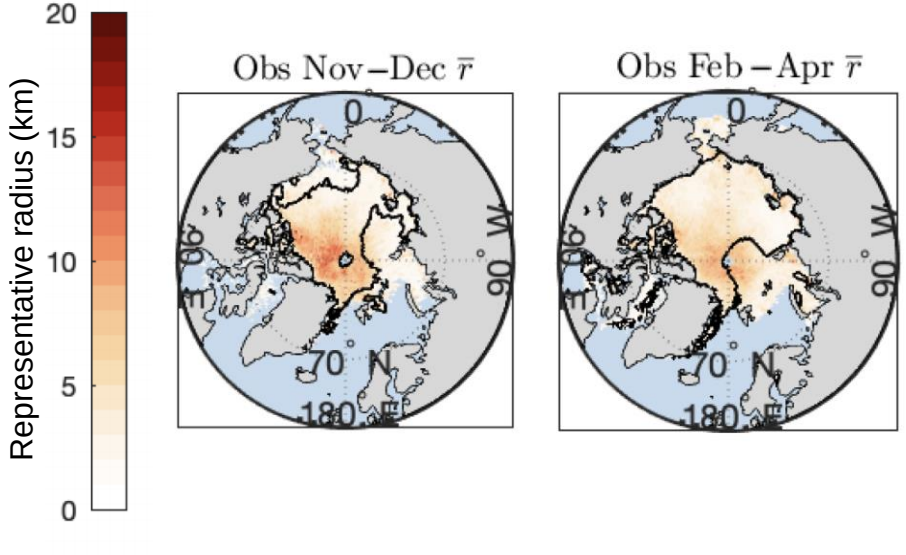

Sea ice thickness observations

AGU100 ADVANCING EARTH AND SPACE SCIENCE

JGR Oceans

RESEARCH ARTICLE
10.1029/2019JC015232

Assessing the Impact of Lead and Floe Sampling on Arctic Sea Ice Thickness Estimates from Envisat and CryoSat-2

Key Points:
- The European Space Agency's Envisat and CryoSat-2 satellites could provide continuous estimates of Arctic sea ice thickness dating back to 2002
- Envisat preferentially samples wider, thicker sea ice floes compared

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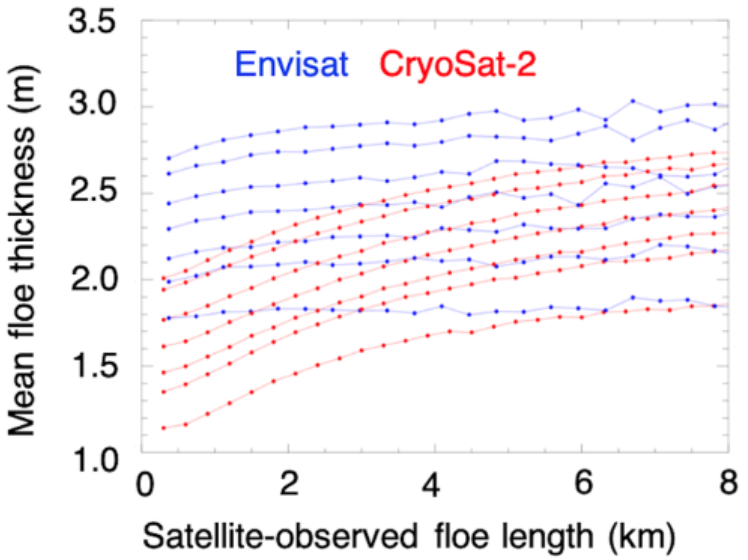
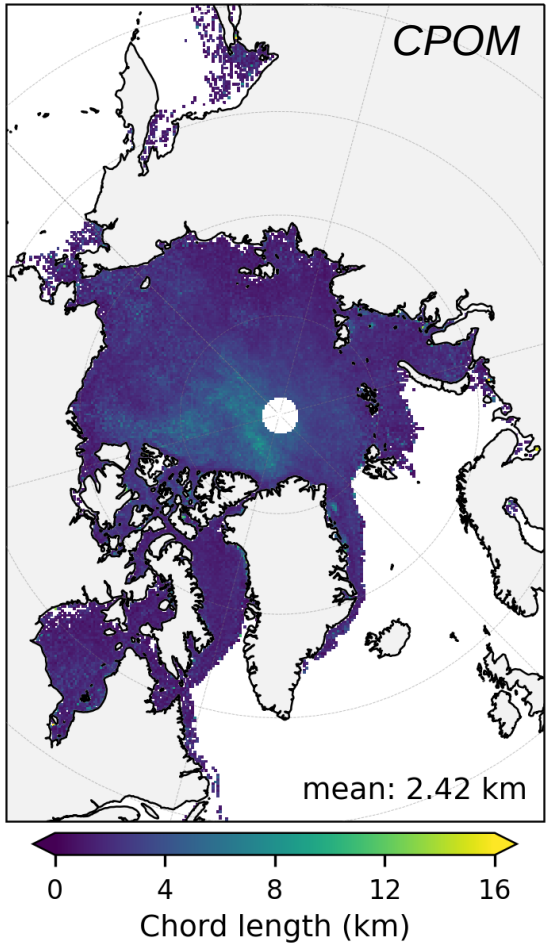
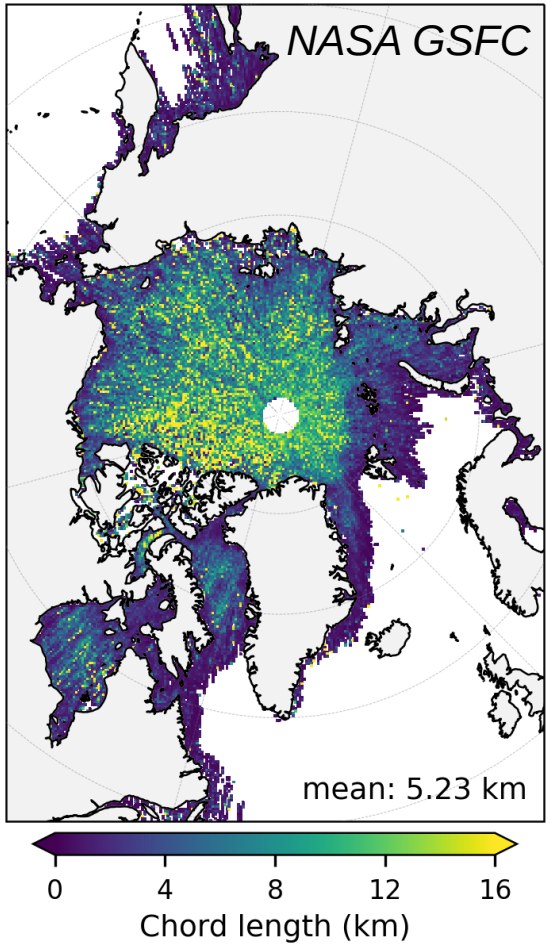


Arctic sea ice floe lengths: Nov 2018-Apr 2019

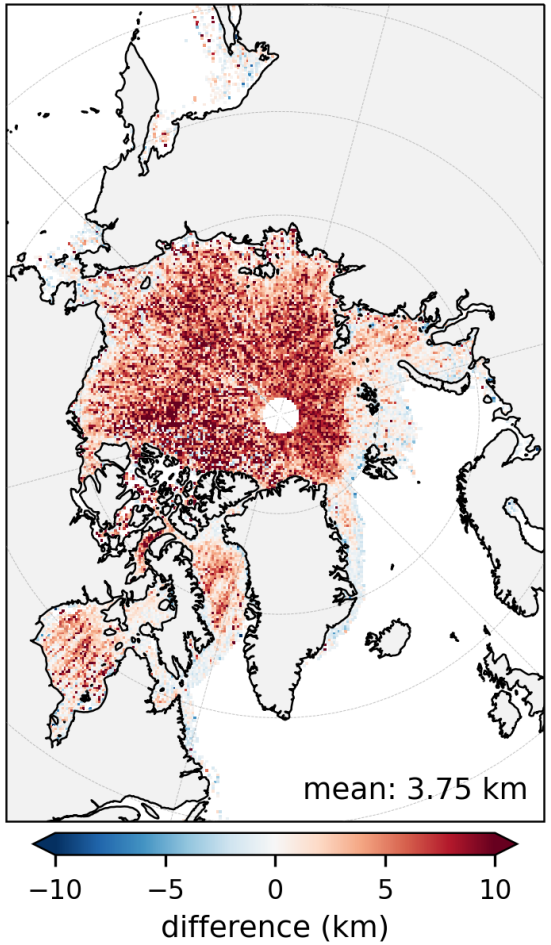
CryoSat-2



ICESat-2

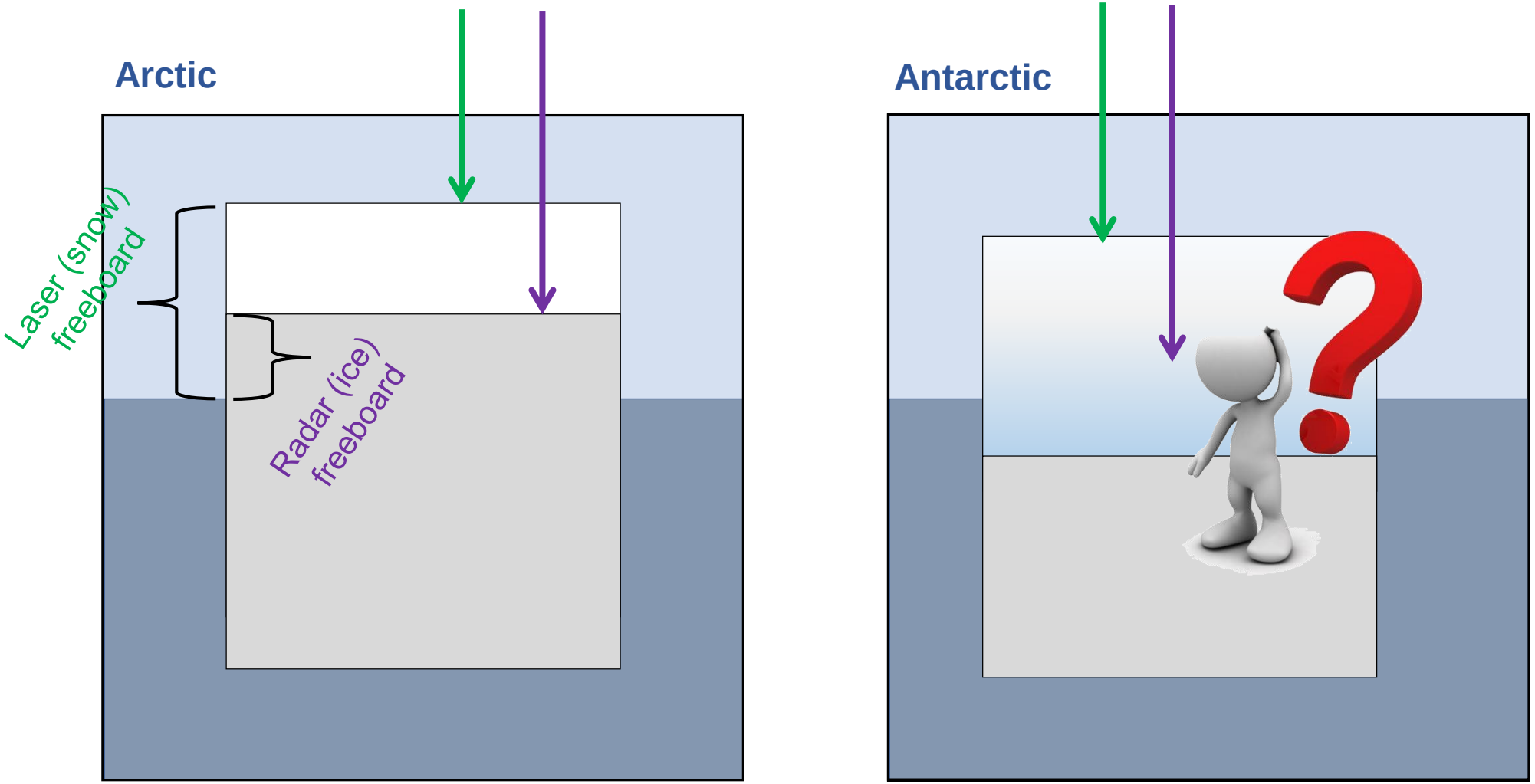


ICESat-2 – CryoSat-2

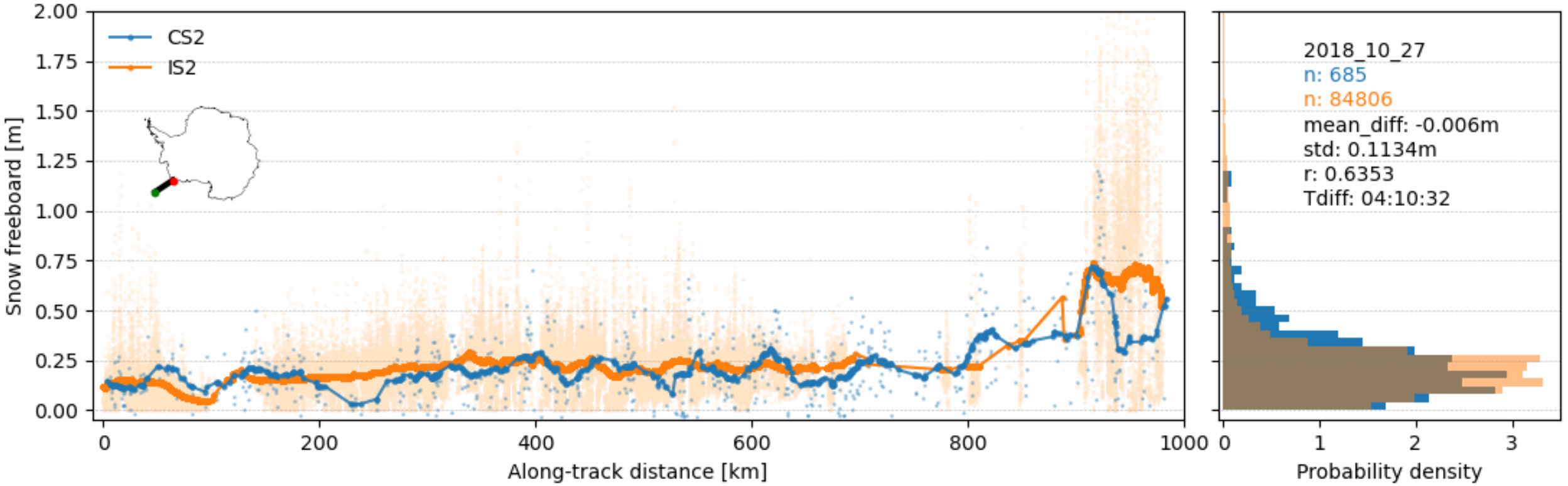


Alek Petty (NASA GSFC/UMD)

ICESat-2 and CryoSat-2 over Antarctic sea ice



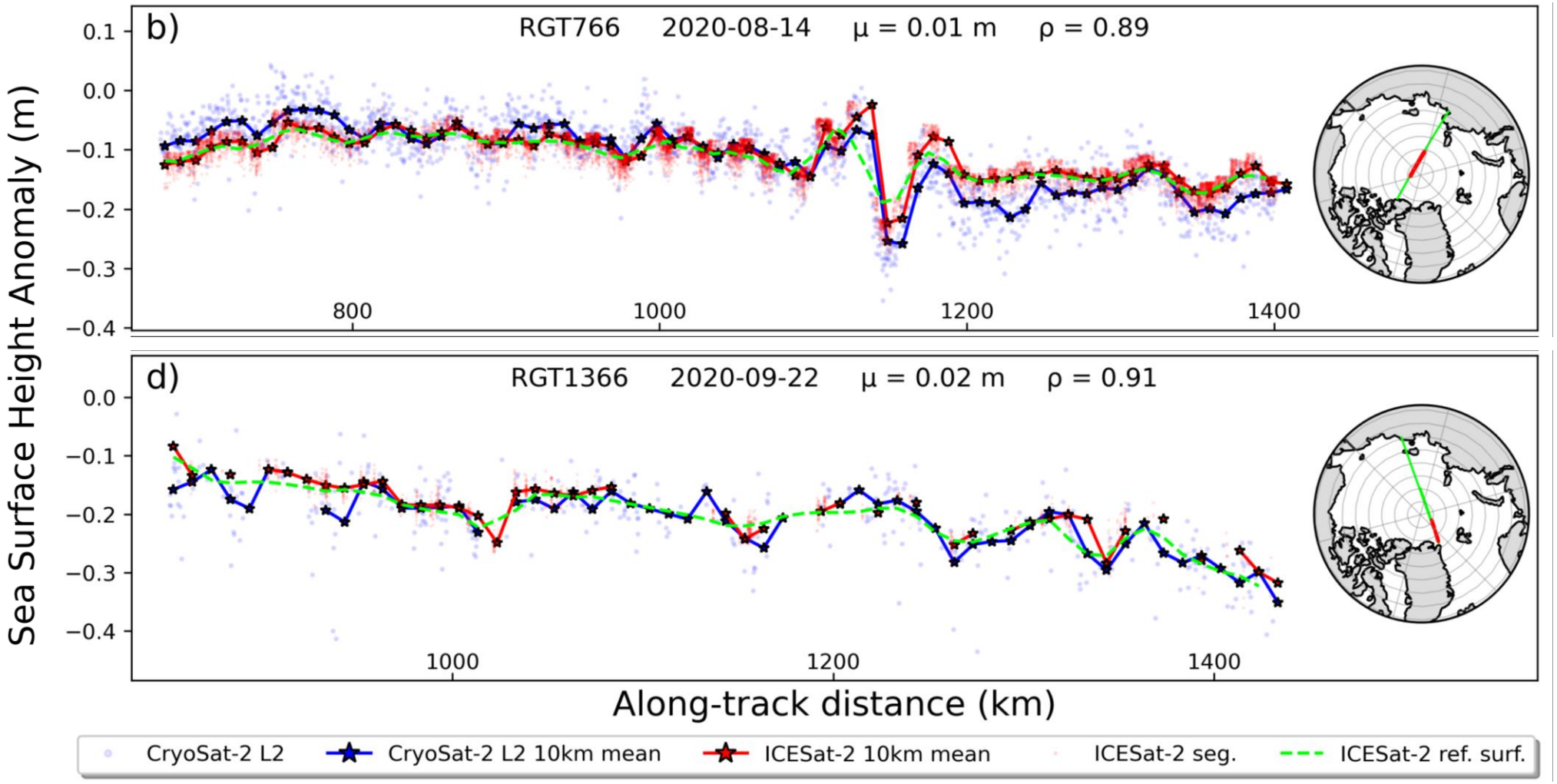
Antarctica: Along-track snow freeboard



Steven Fons (NASA GSFC/UMD)

#CRYO2ICE

#Cryo2Ice first results: Arctic SSH anomalies



Marco Bagnardi (NASA GSFC/ADNET)

Seed Questions: How to make "meaningful" comparisons

(1) Should we have a unified method for intercomparisons of data with different resolutions (e.g. CS2/IS2, CS2/airborne)?

(2) How useful are ~3hr separations over sea ice?

(3) To what degree will (1) be solved by future dual-frequency missions (e.g. CRISTAL Ku/Ka)?