



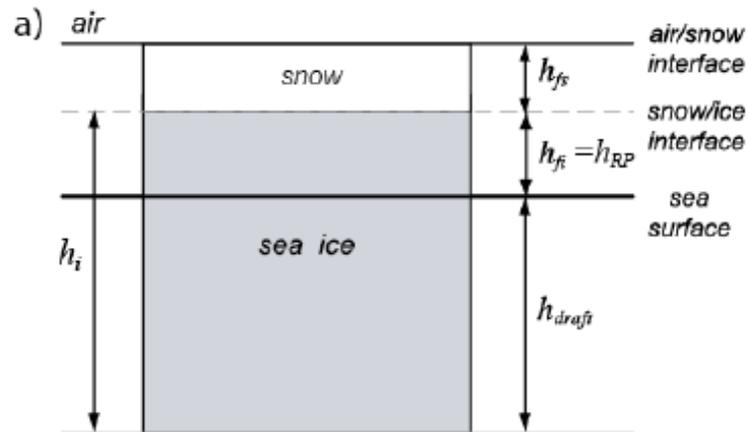
# SWOT over the ice-covered ocean

Ron Kwok and Thomas Armitage

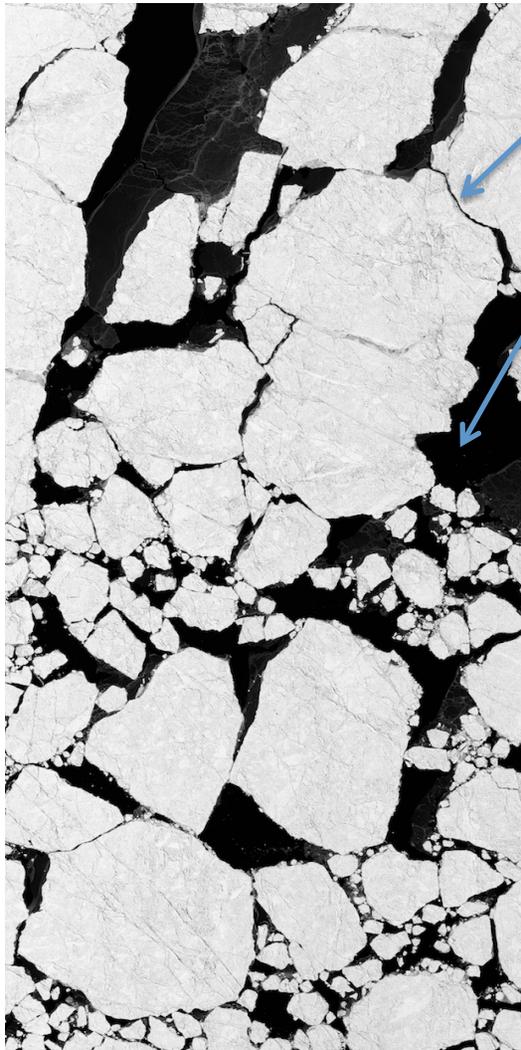
Jet Propulsion Laboratory  
California Institute of Technology  
Pasadena, CA



SWOT Science Team and Cal/Val Workshop  
Toulouse, 26-29 June 2017

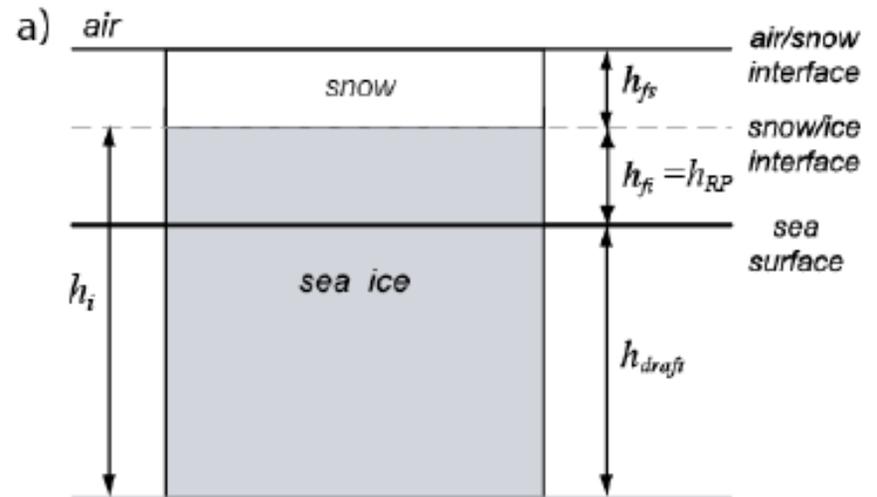


- Demonstrate the feasibility of extracting
  - sea ice freeboard/thickness - freeboard is the height of the ice surface above the local sea surface
  - sea surface height



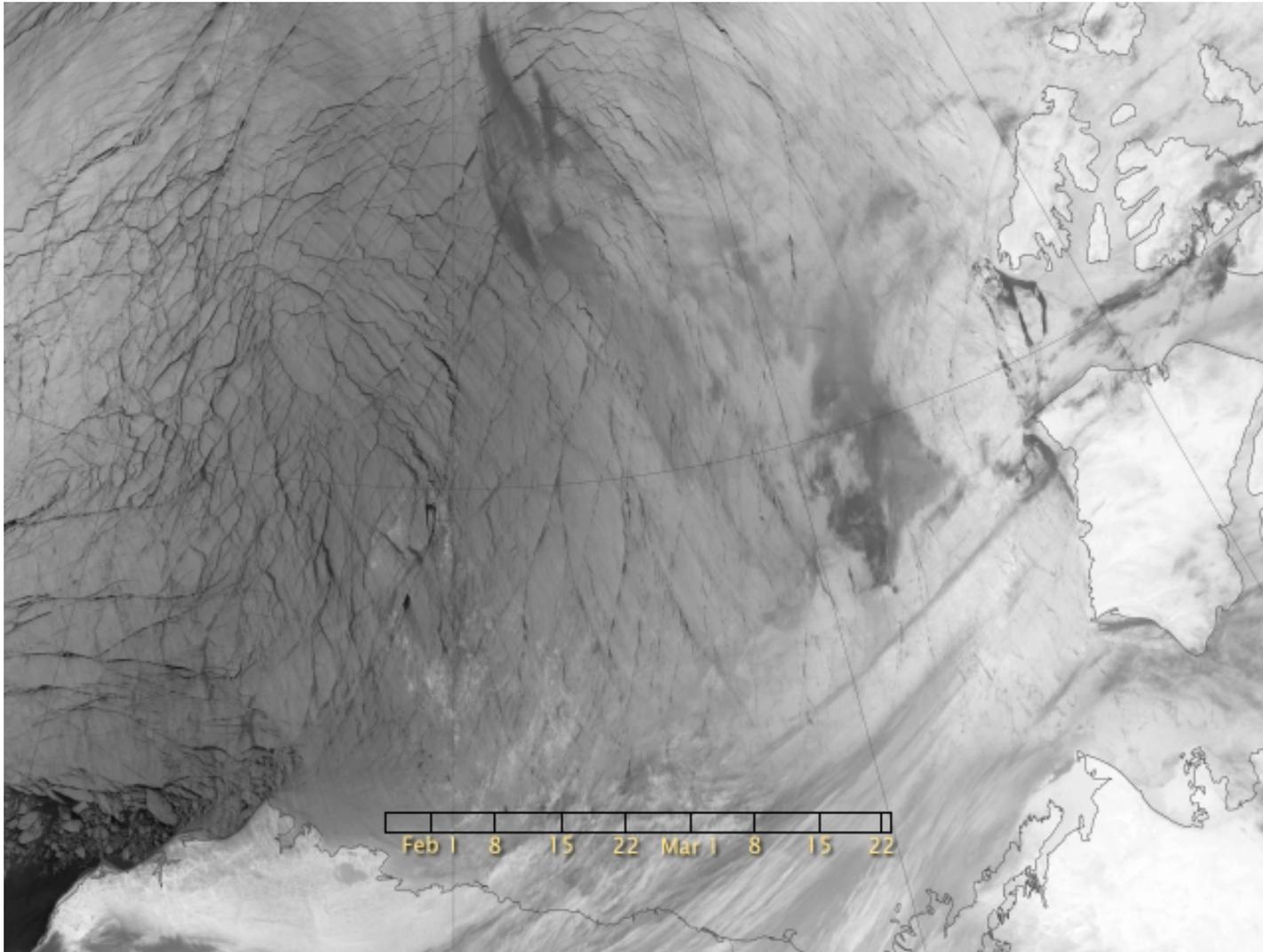
Sea ice

Leads (local sea surface)

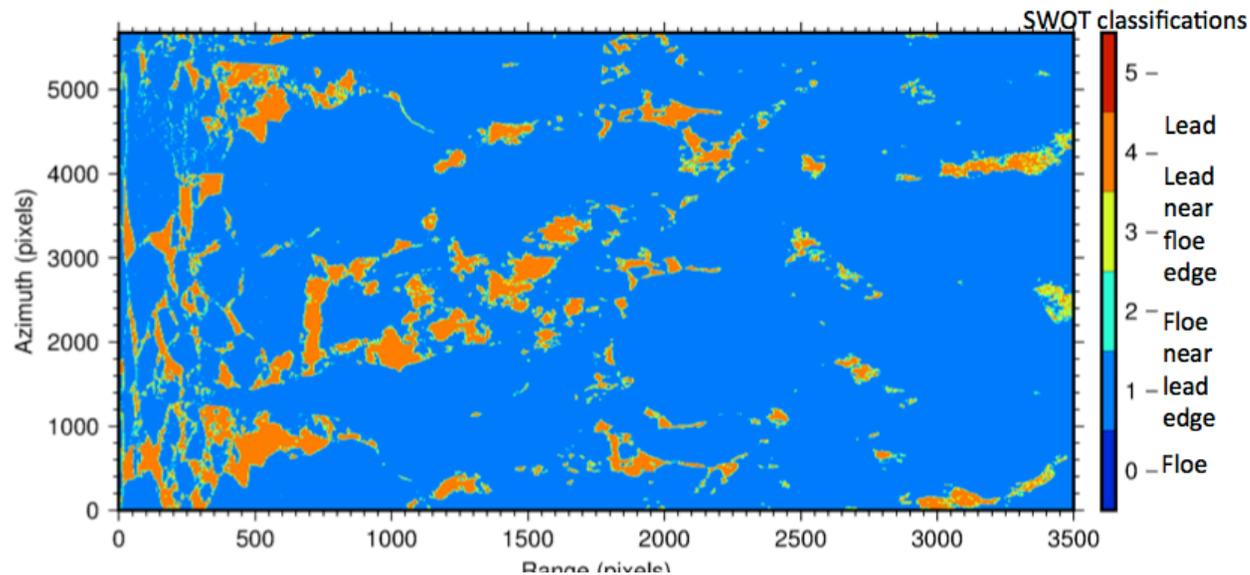
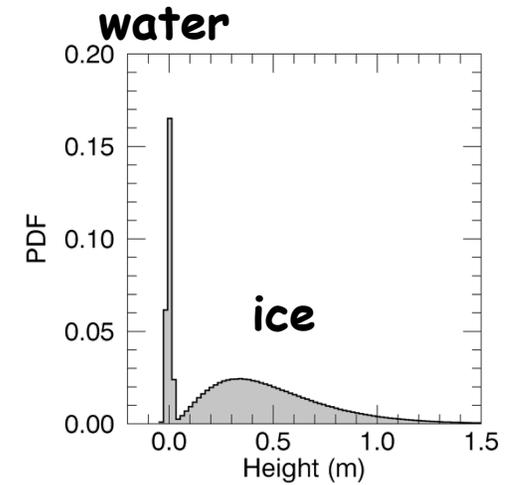
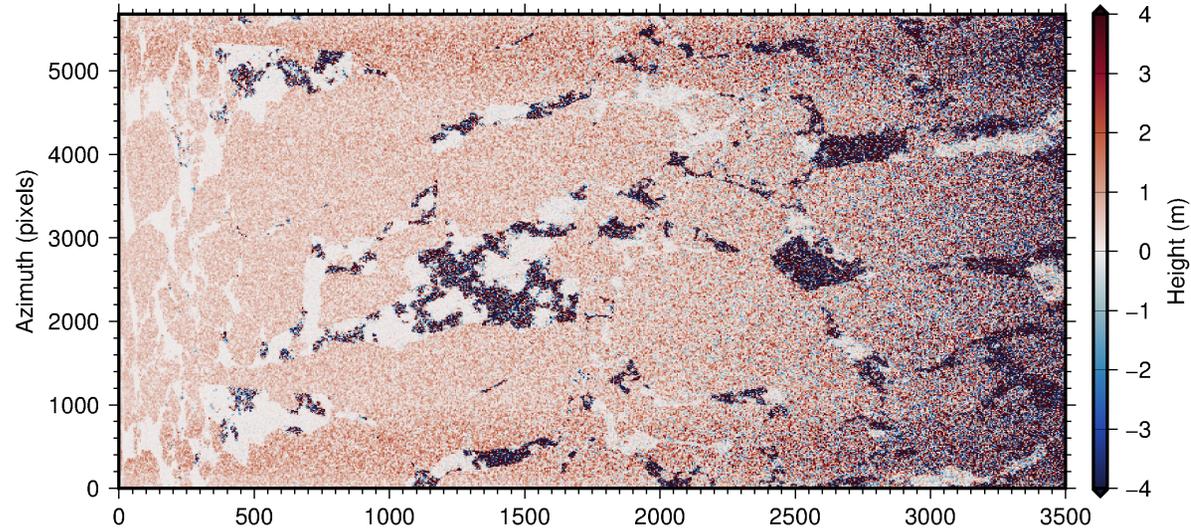


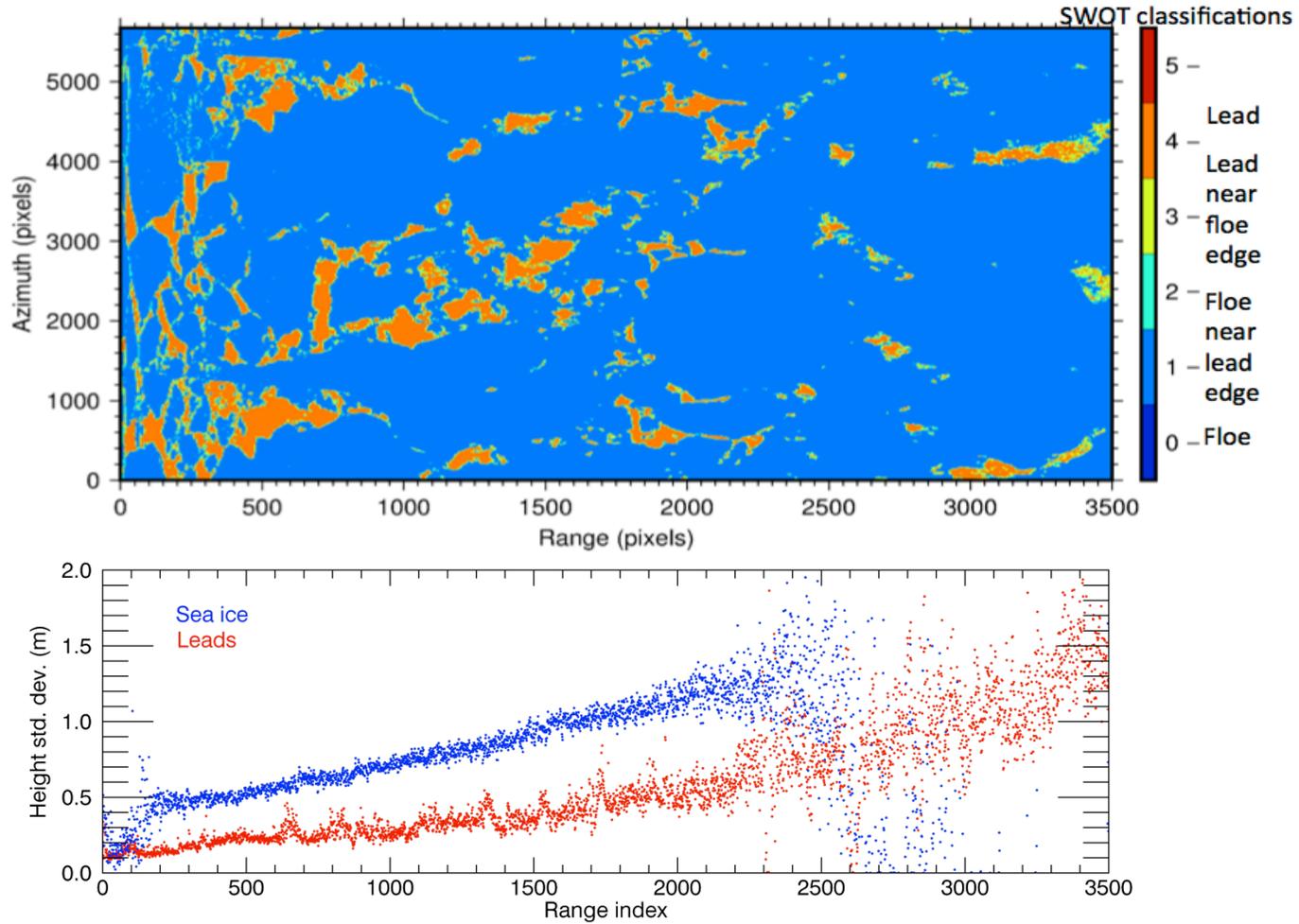


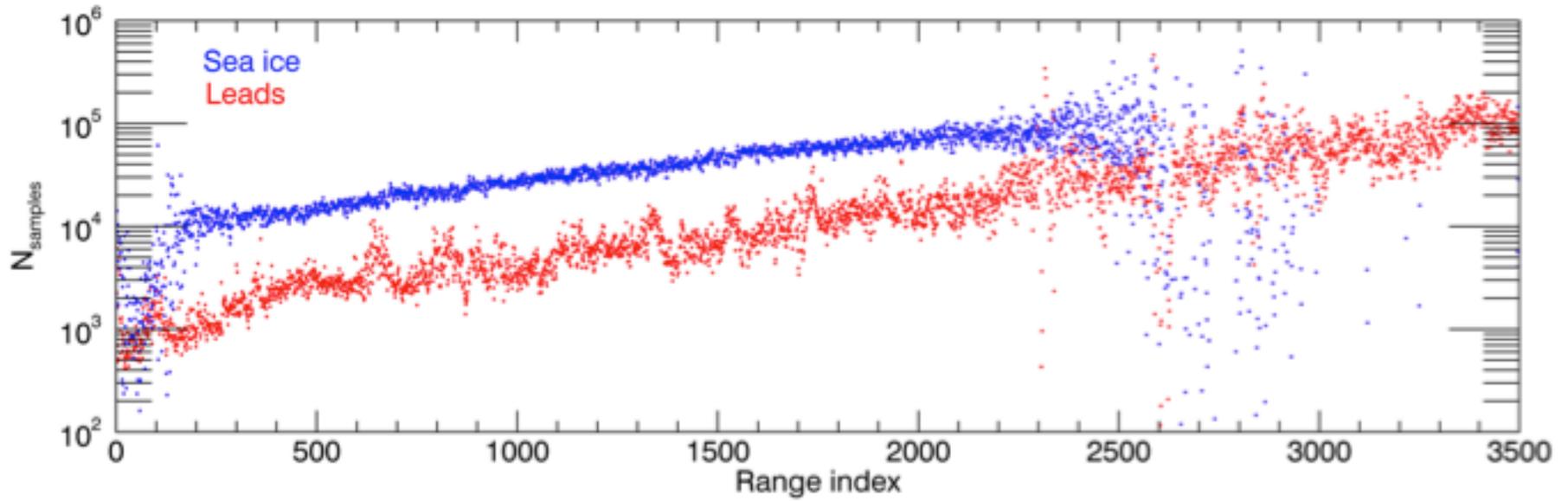
# Example of linear fracture patterns



# Simulated heights (from SWOT Simulator)







5.6 m x (70 m -10m)

*The number of looks required, as a function of range, in order to achieve 3cm height precision.*

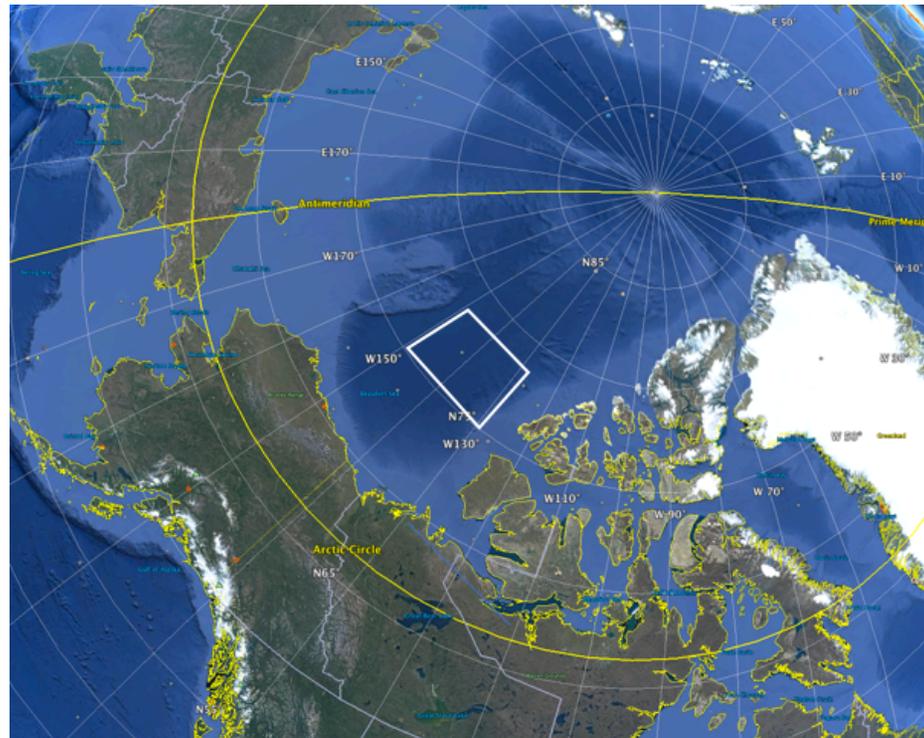
- *Leads: 1,000 – 10,000*
- *Floes: 10,000 – 80,000*



# Proposed Coverage for Demonstration



- High-resolution data collection
  - For demonstration of SWOT over sea ice ( $\sim 200,000 \text{ km}^2$ ) during DJF
- Simultaneous coverage from ICESat-2 and NISAR





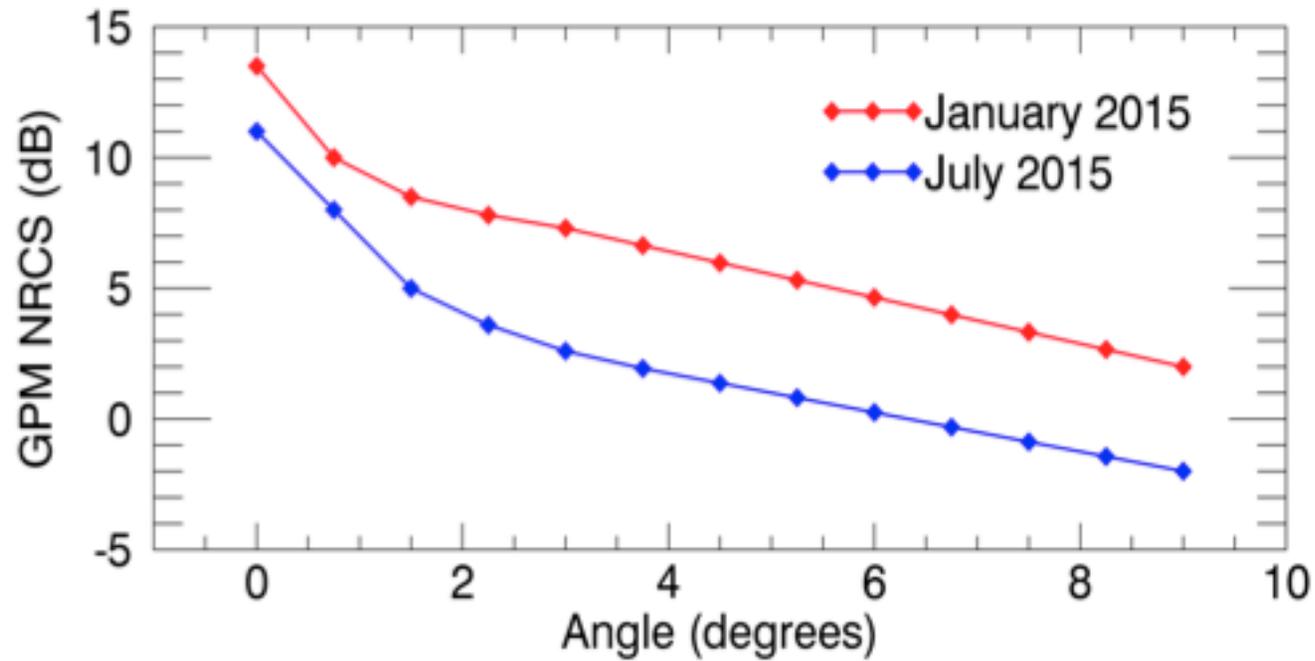
## Summary Remarks

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- Preliminary simulations with SWOT simulator show potentially useful freeboard and ocean surface retrievals from SWOT
- Require HR data for retrievals from the ice cover
- Proposed Arctic coverage for demonstration of SWOT utility over the ice-covered ocean
- Suggest collection of sea ice data (either Arctic or Southern Ocean) during initial fast sampling phase (1-day) if opportunity allows

Thanks to Brent Williams (JPL) for helping with use of SWOT simulator



(Provided by D. Fernandez)