

Cross validation of in situ, airborne and remote sensing data from East Antarctica

A. Pfaffling¹, T. Worby² &
R. Massom²

(1) formerly AWI, now Consultant, Germany.

(2) Australian Antarctic Division & ACE CRC, Australia.

Sea Ice data X-Validation

- Database & Sensors
- in-situ validation
- Remote sensing



03.08.2006

Pfaffling et.al. Sea Ice X-Validation

2

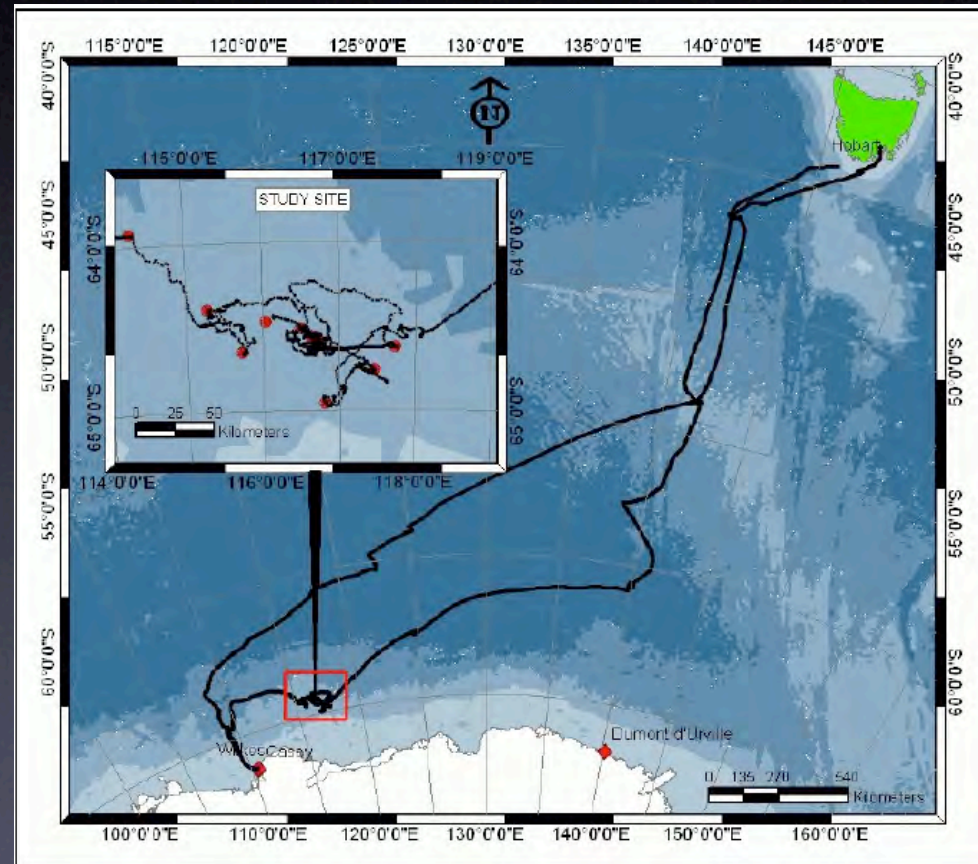
ARISE

Antarctic Remote Ice Sensing Expedition

RSV "Aurora Australis" expedition V1 03/04
11. Sep. - 30. Oct. 2003 East Antarctica



Cruise track

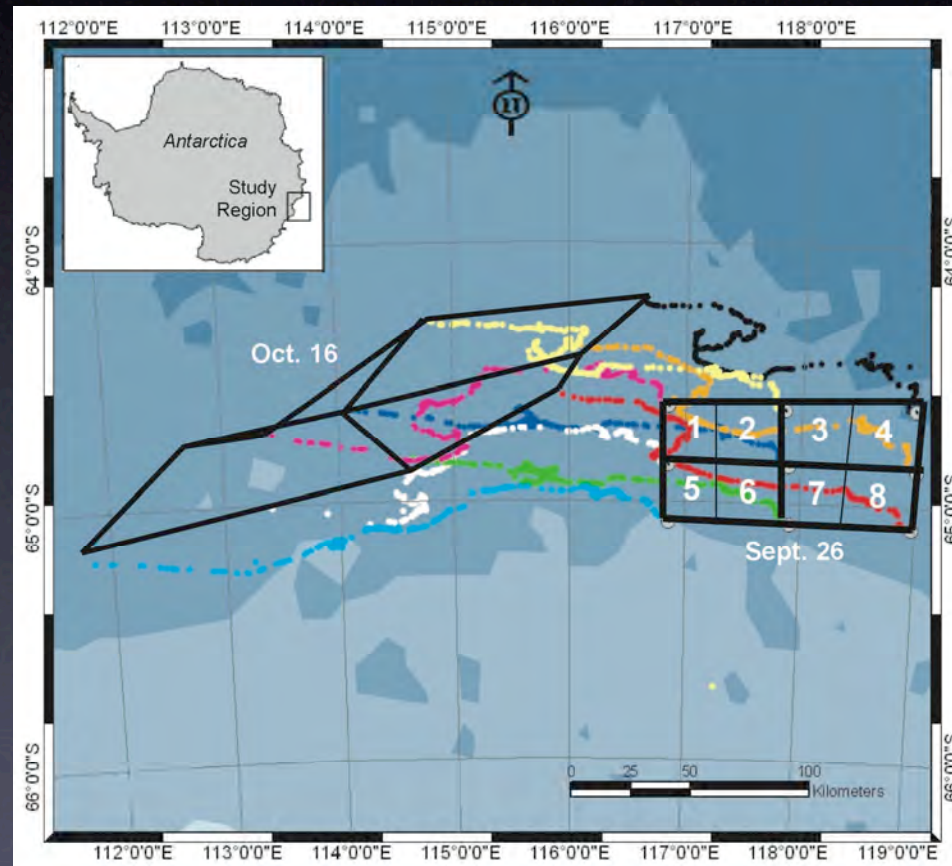


03.08.2006

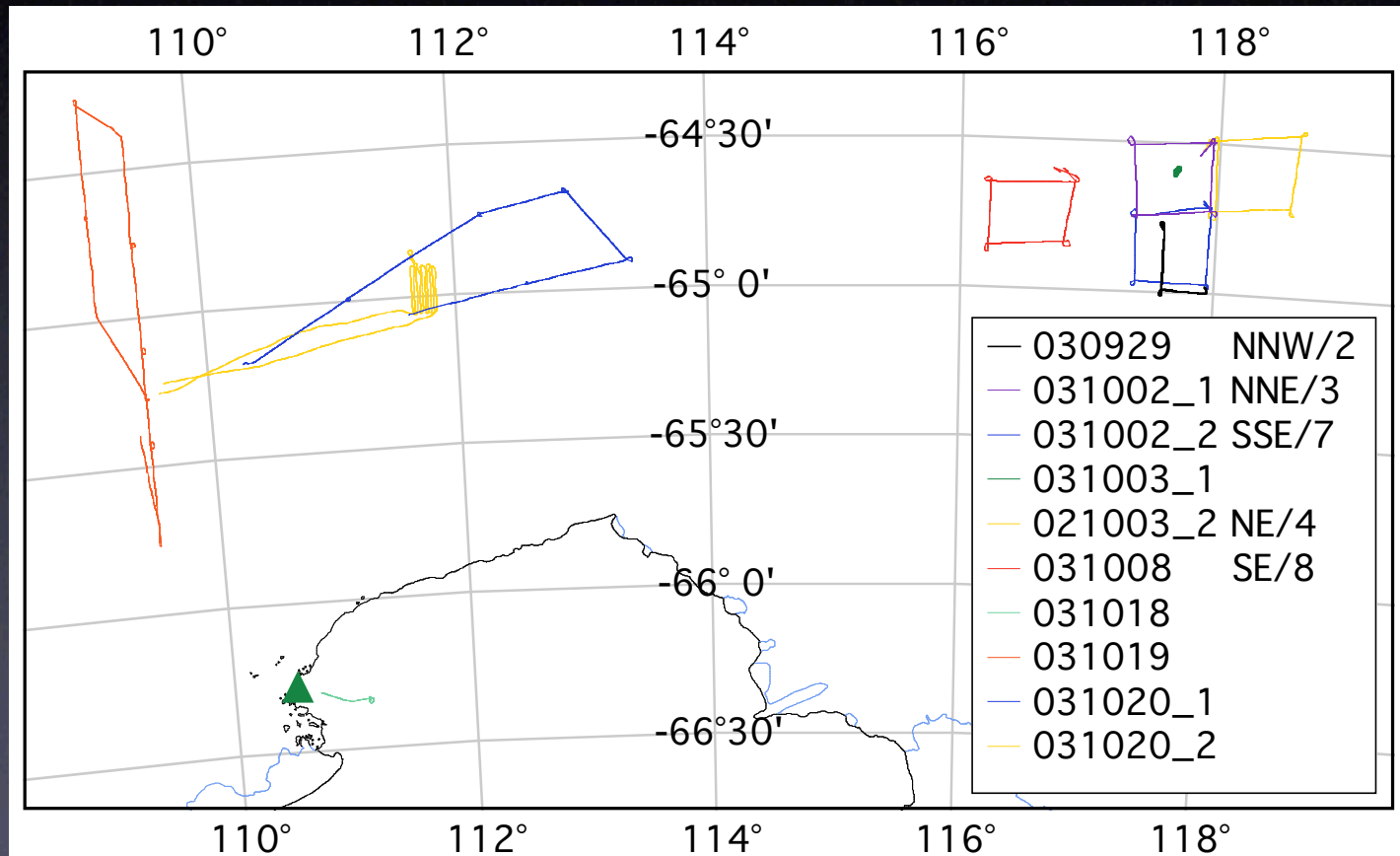
Pfaffling et.al. Sea Ice X-Validation

4

Ice station layout



Flight map ARISE



Sea Ice data X-Validation

- Database & Sensors
- in-situ validation
- Remote sensing



03.08.2006

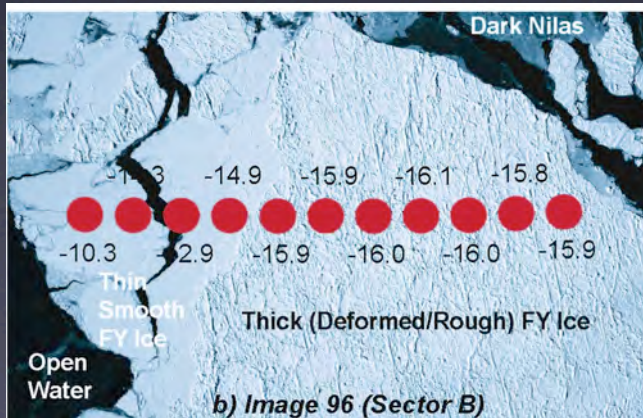
Pfaffling et.al. Sea Ice X-Validation

7

Gadgets



- AWI HEM sensor
- total thickness



- Aerial photogr.
 - IR thermometer
- classification

Sea Ice data X-Validation

- Database & Sensors
- In-situ validation
- Remote sensing



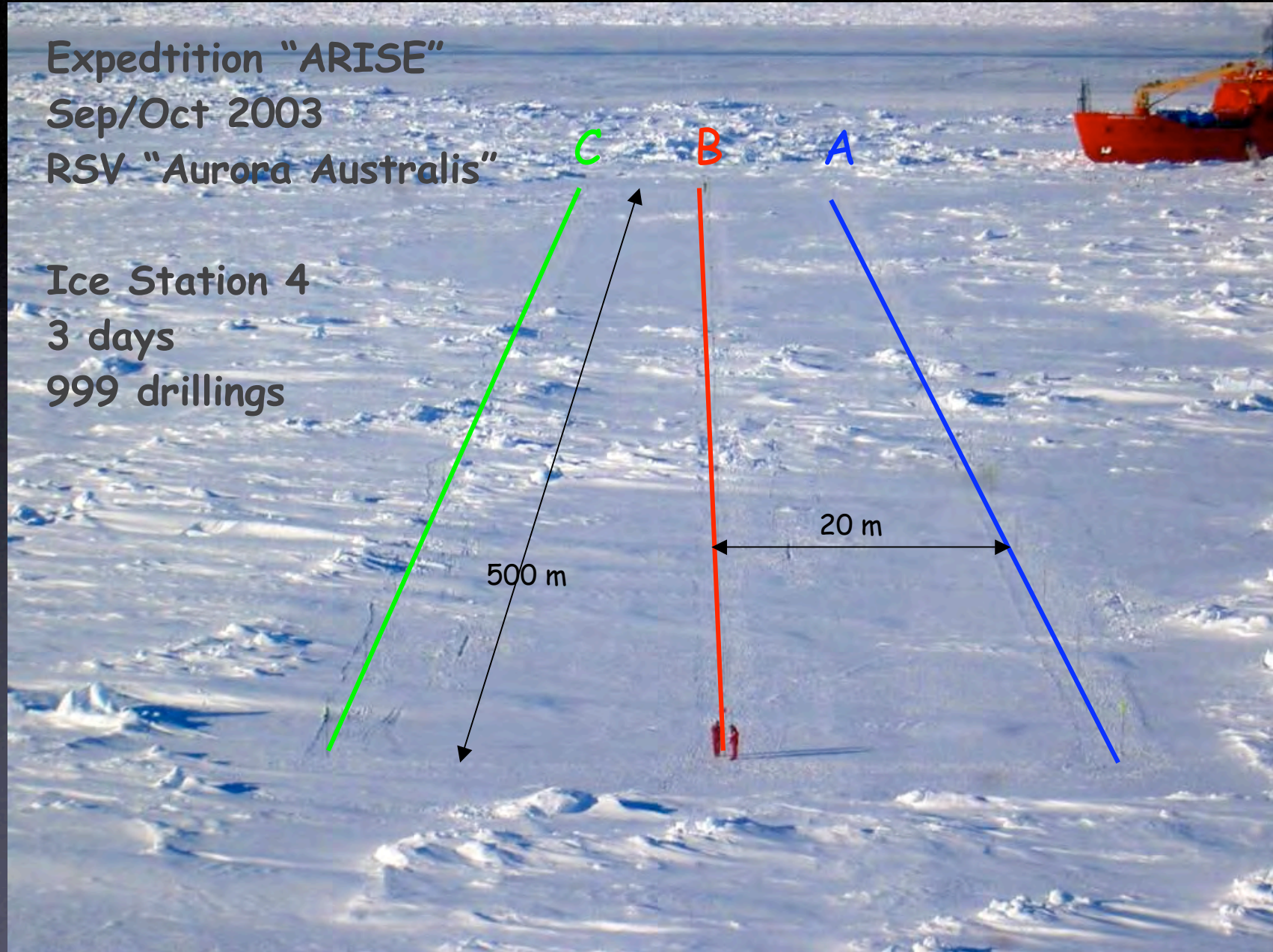
03.08.2006

Pfaffling et.al. Sea Ice X-Validation

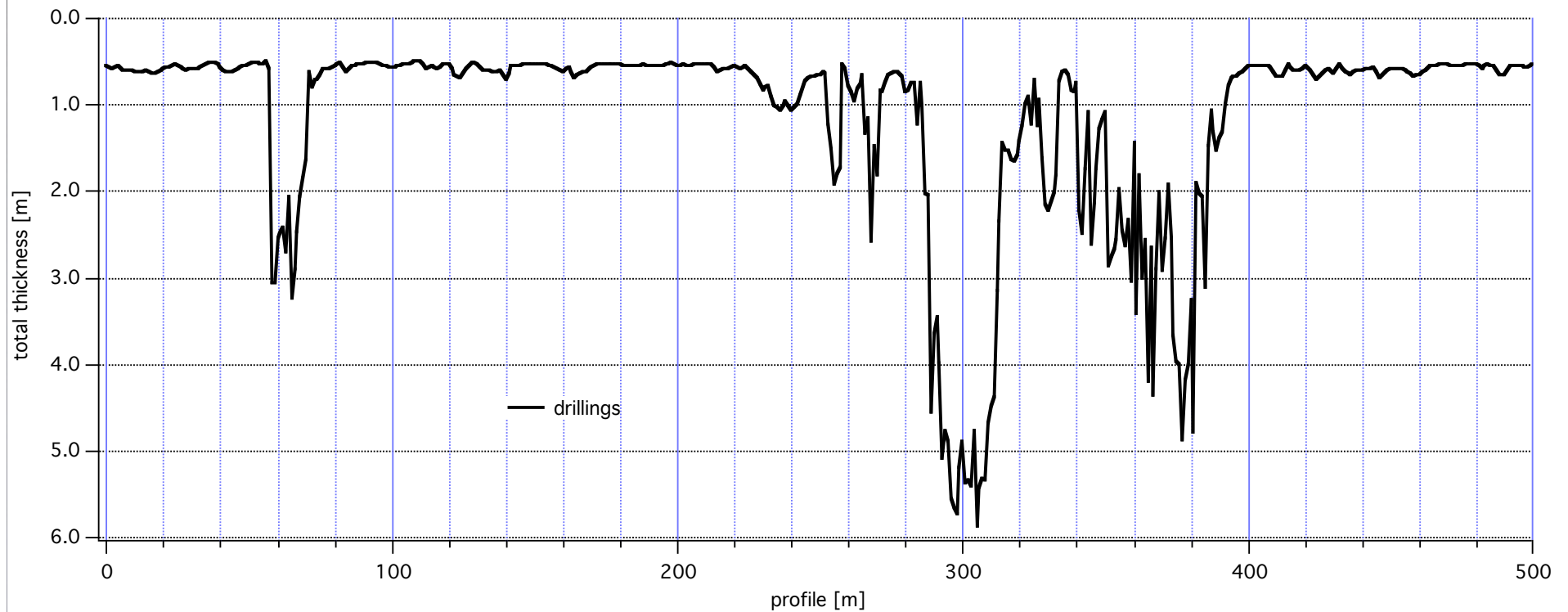
9

Expedition "ARISE"
Sep/Oct 2003
RSV "Aurora Australis"

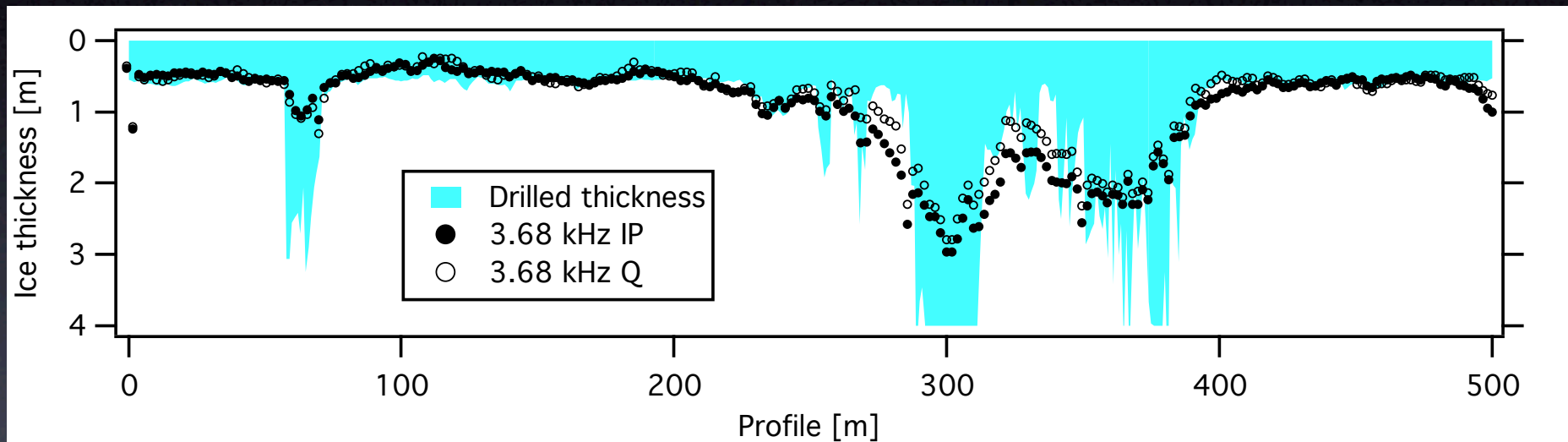
Ice Station 4
3 days
999 drillings

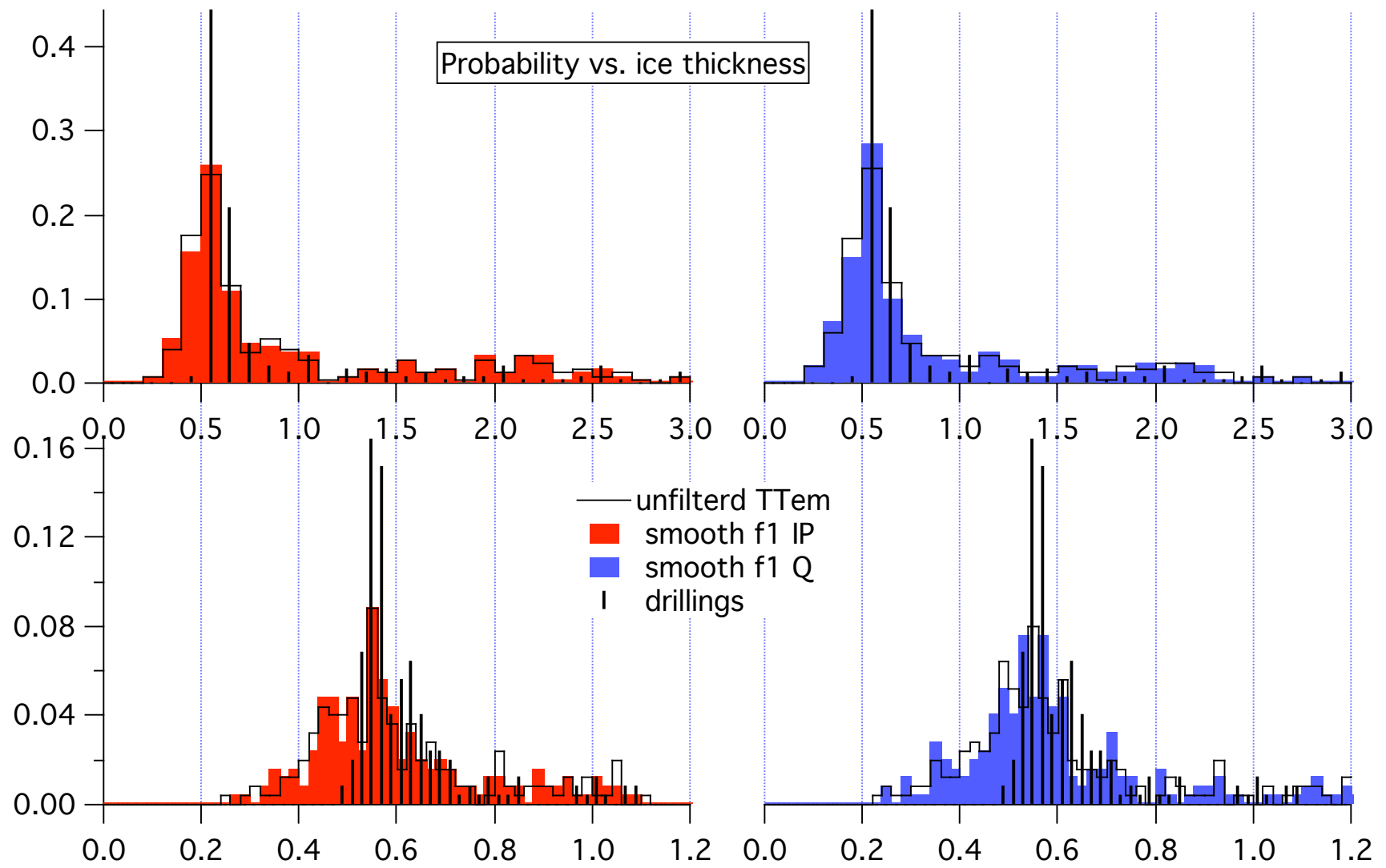


Drilled total thickness



Heli-EM thickness





HEM precision & accuracy

Level ice thickness	1...5 cm	"swath" profile subset	≥ 500 m
Point-by-Point thickness	10...50 cm	foot-print	25 m doughnut

Sea Ice data X-Validation

- Database & Sensors
- in-situ validation
- Remote sensing

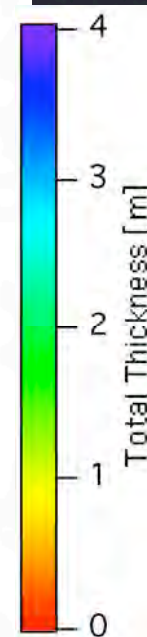
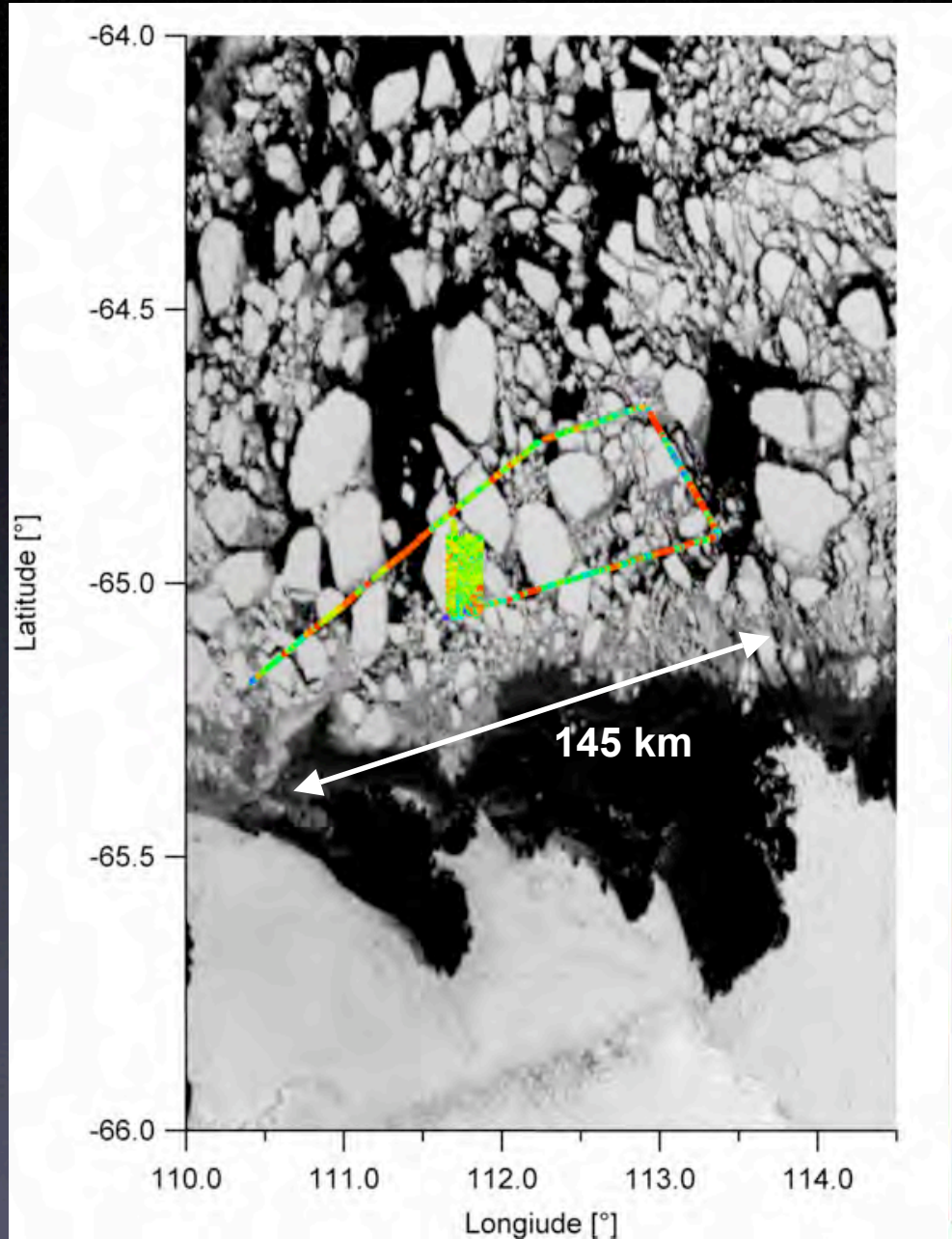


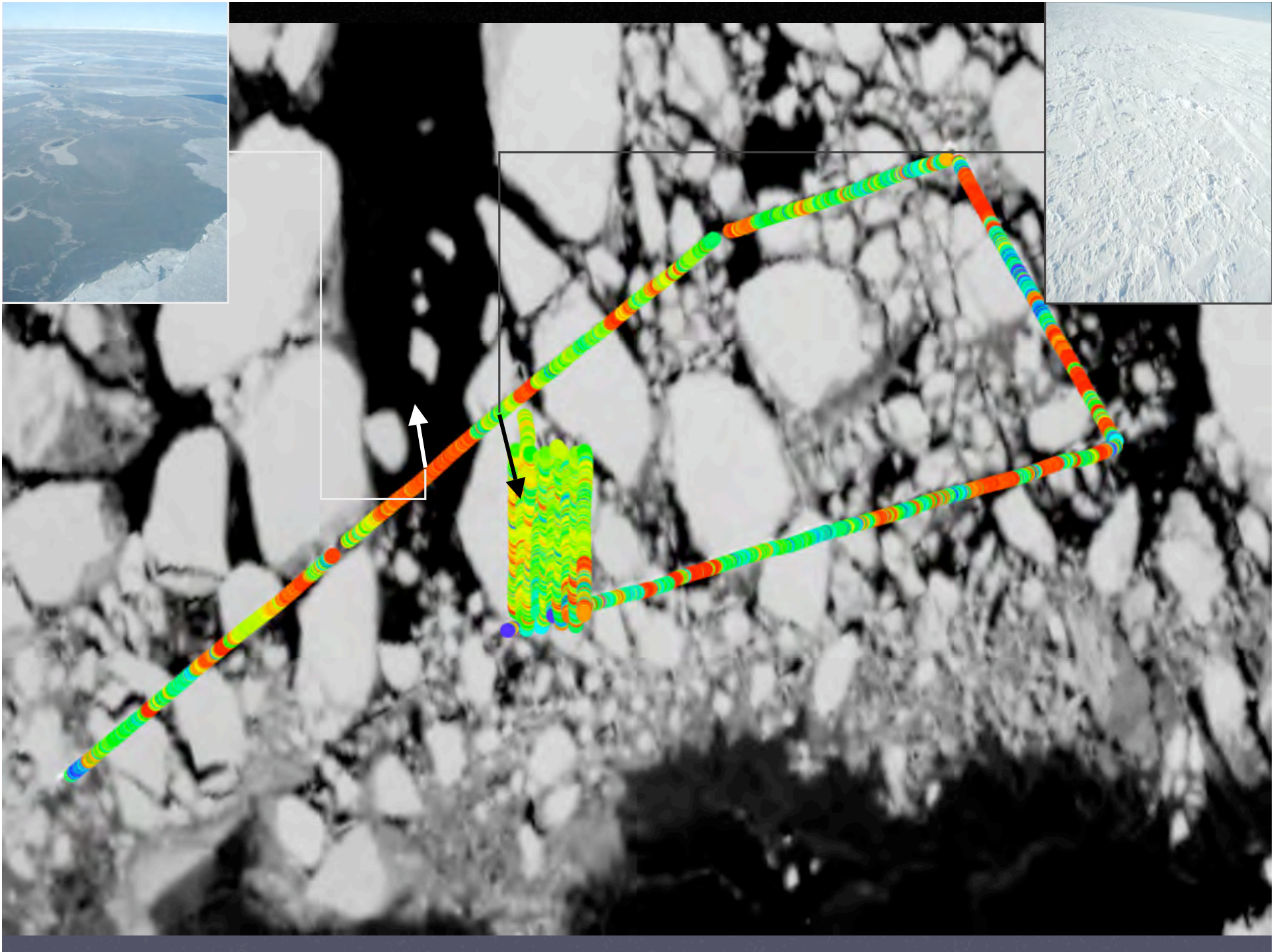
03.08.2006

Pfaffling et.al. Sea Ice X-Validation

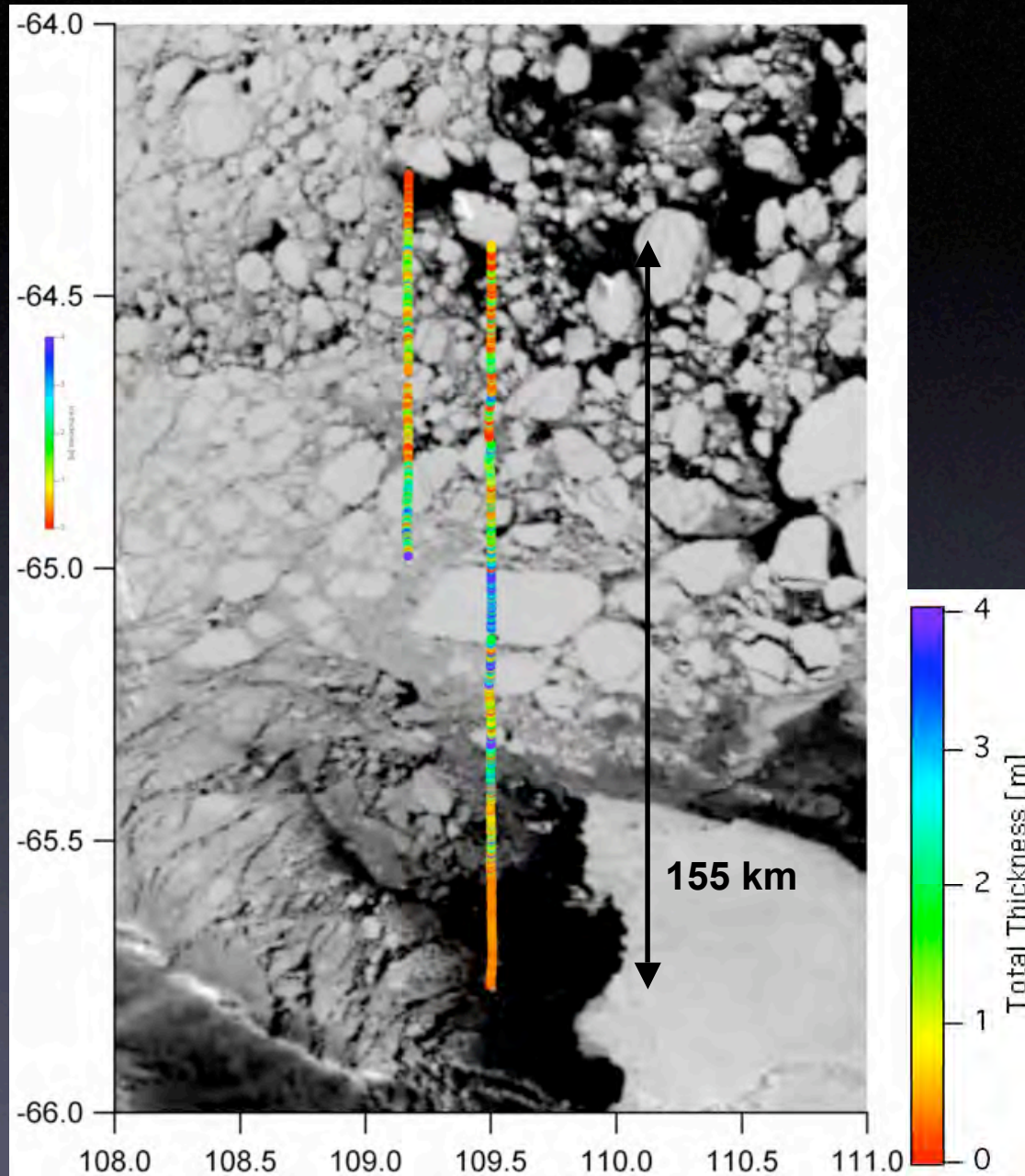
16

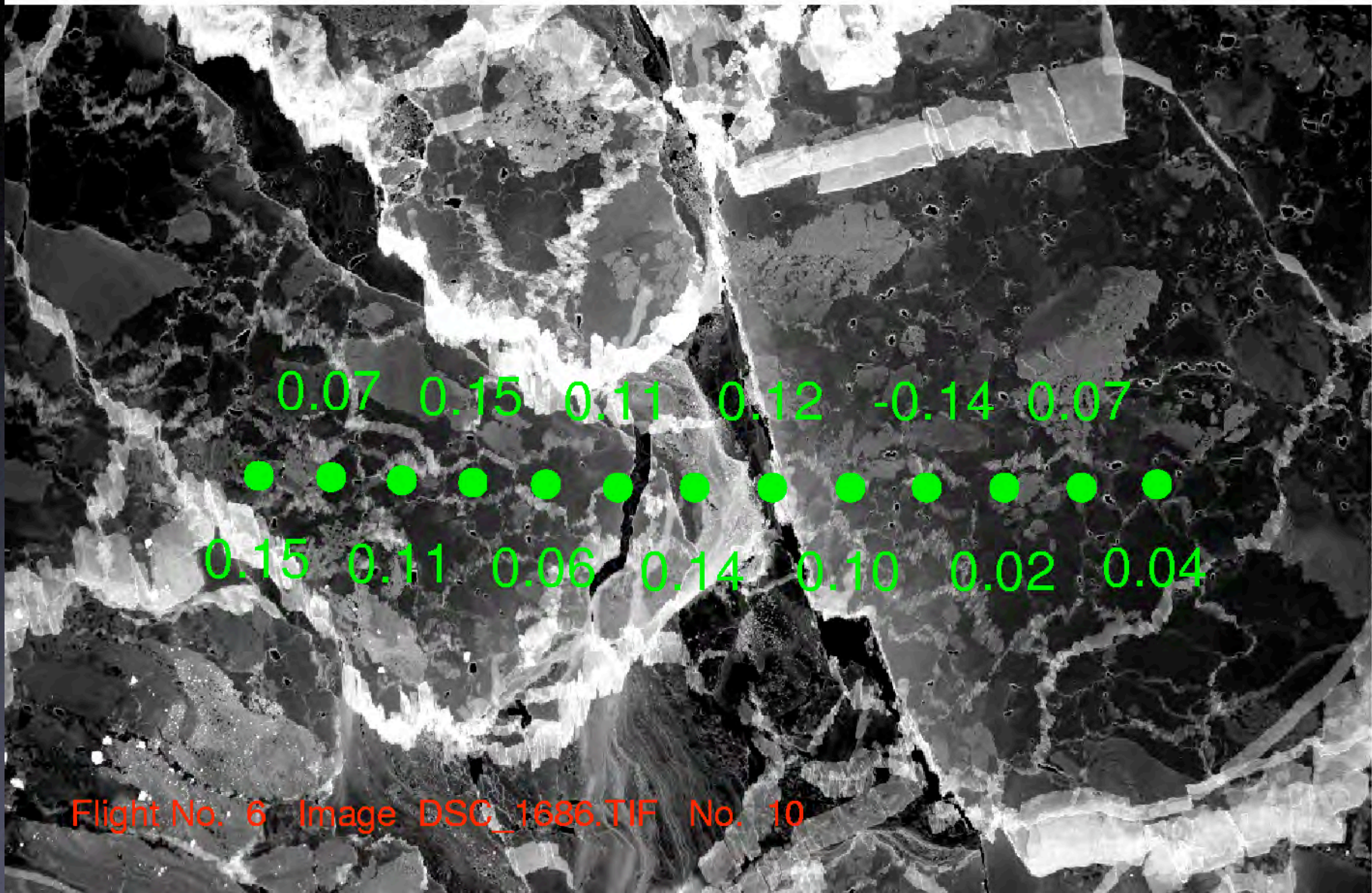
MODIS scene plus EM track



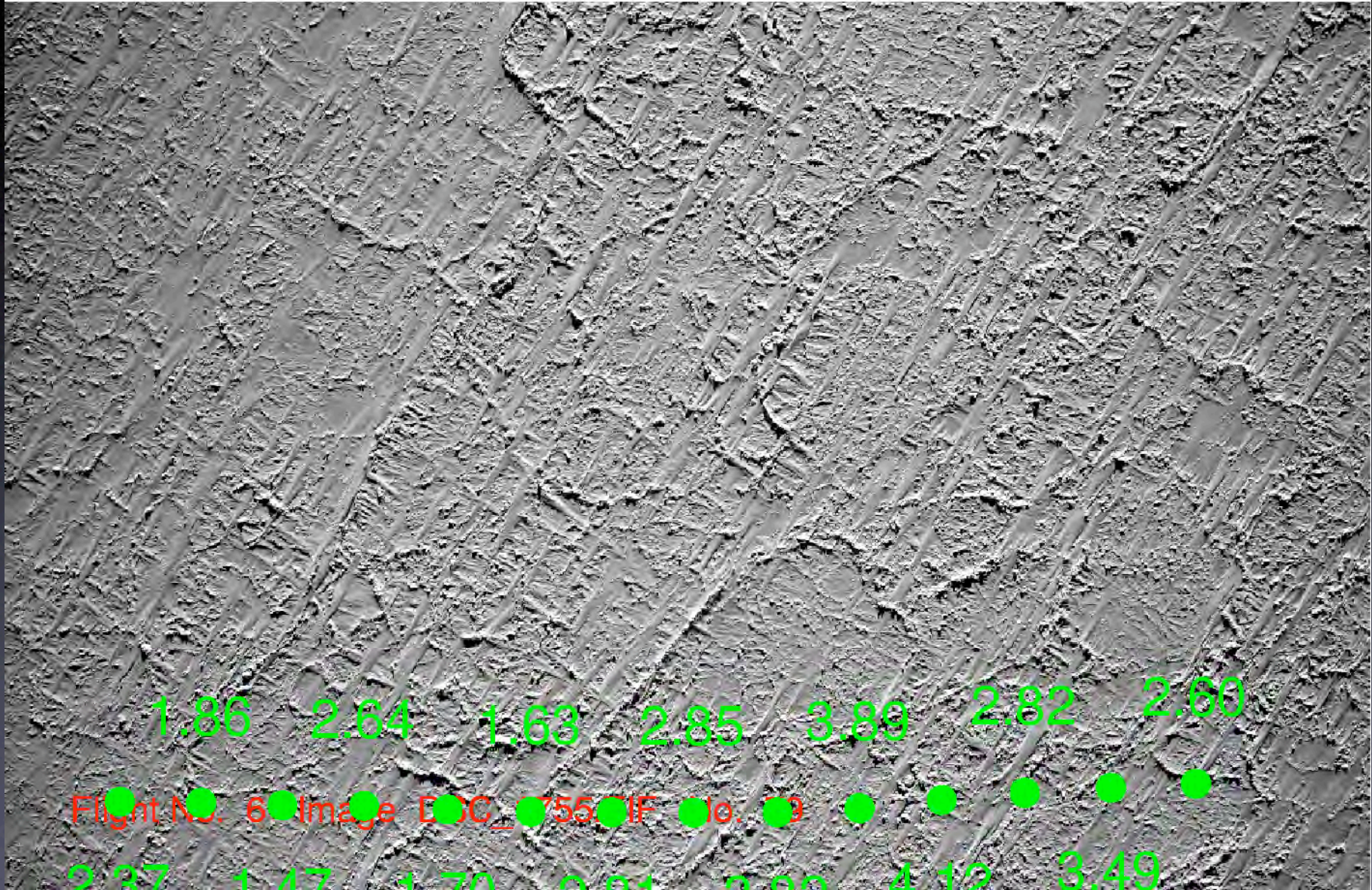


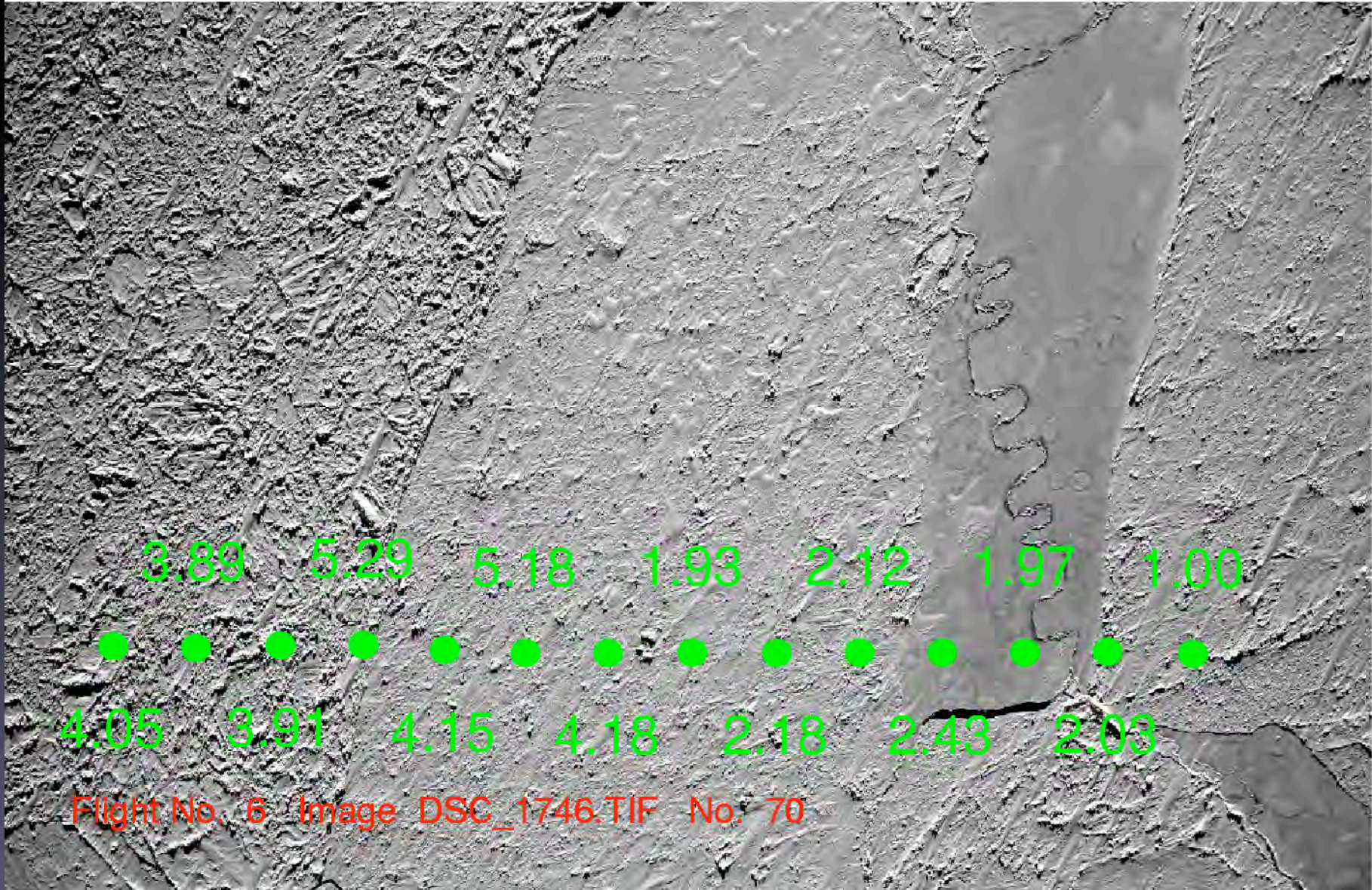
MODIS
+
HEM
+
aerial
photos





Flight No. 6 Image DSC_1686.TIF No. 10





Flight No. 6 Image DSC_1746.TIF No. 70

Next moves

- Get into quantitative x-comp.
- HEM - AMSR-E = Ice thickness?
- Heliborne impulse radar snow thick. in concert with HEM ->

Weddell Sea
Sep/Oct 06

