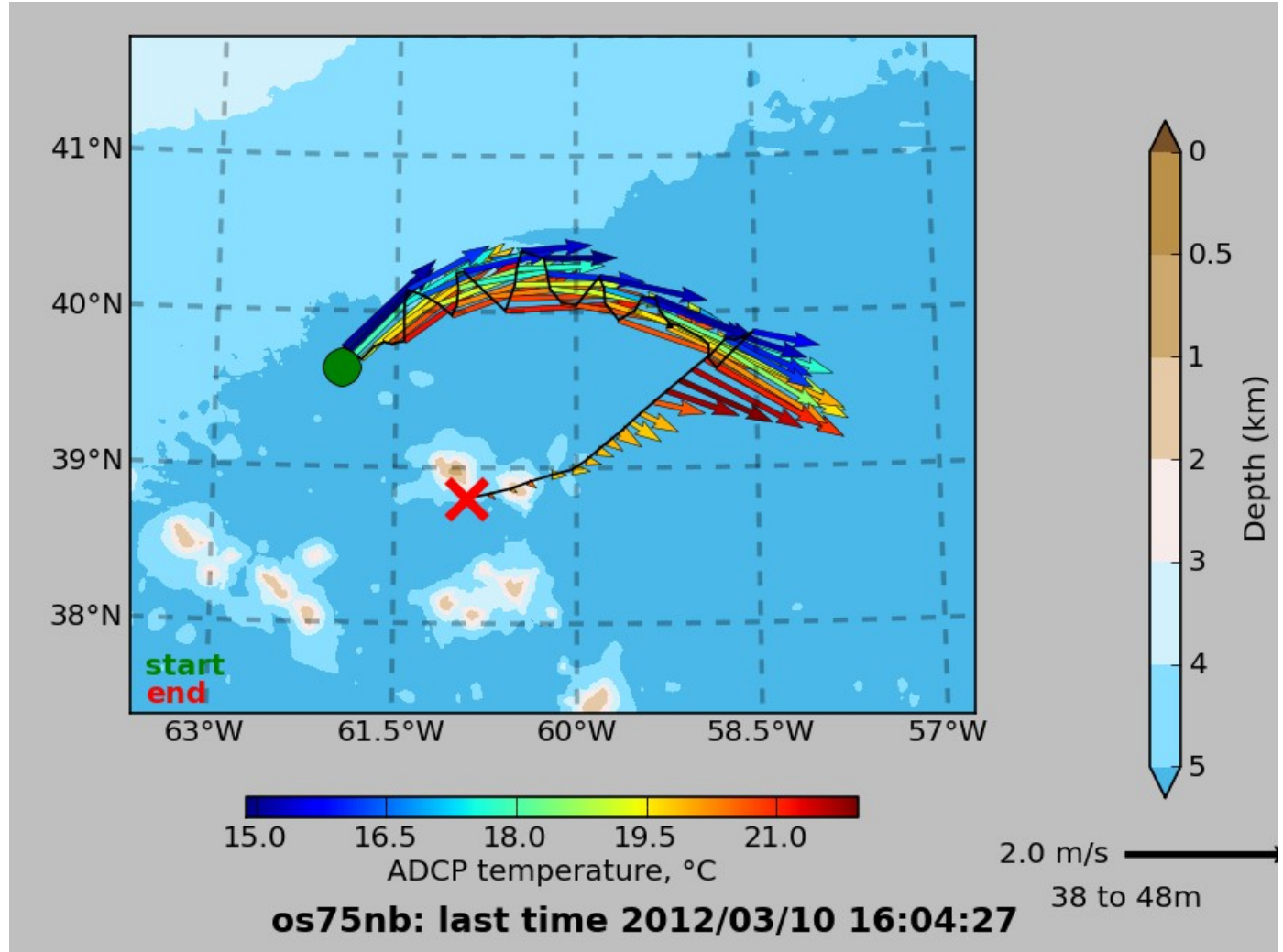
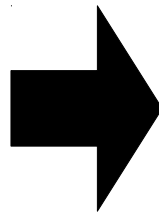
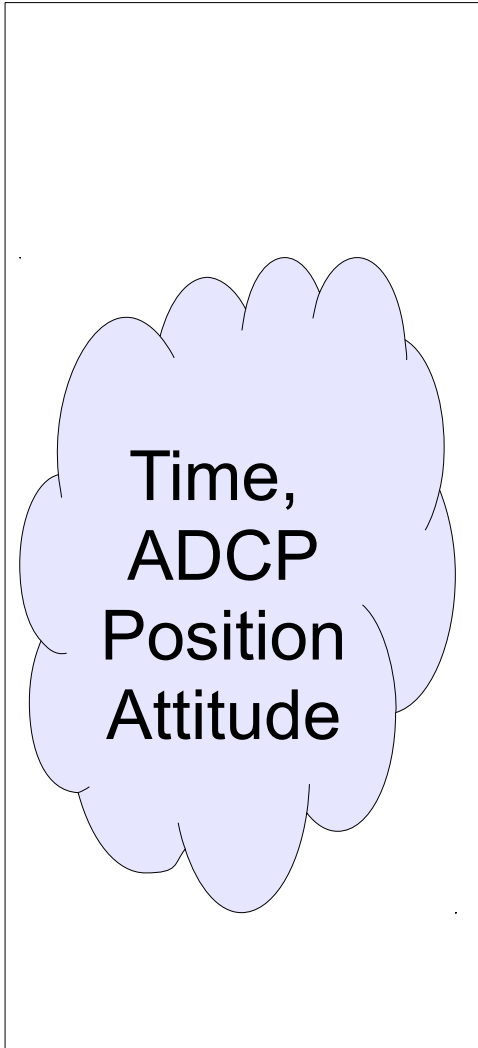


INMARTECH Oct 2018

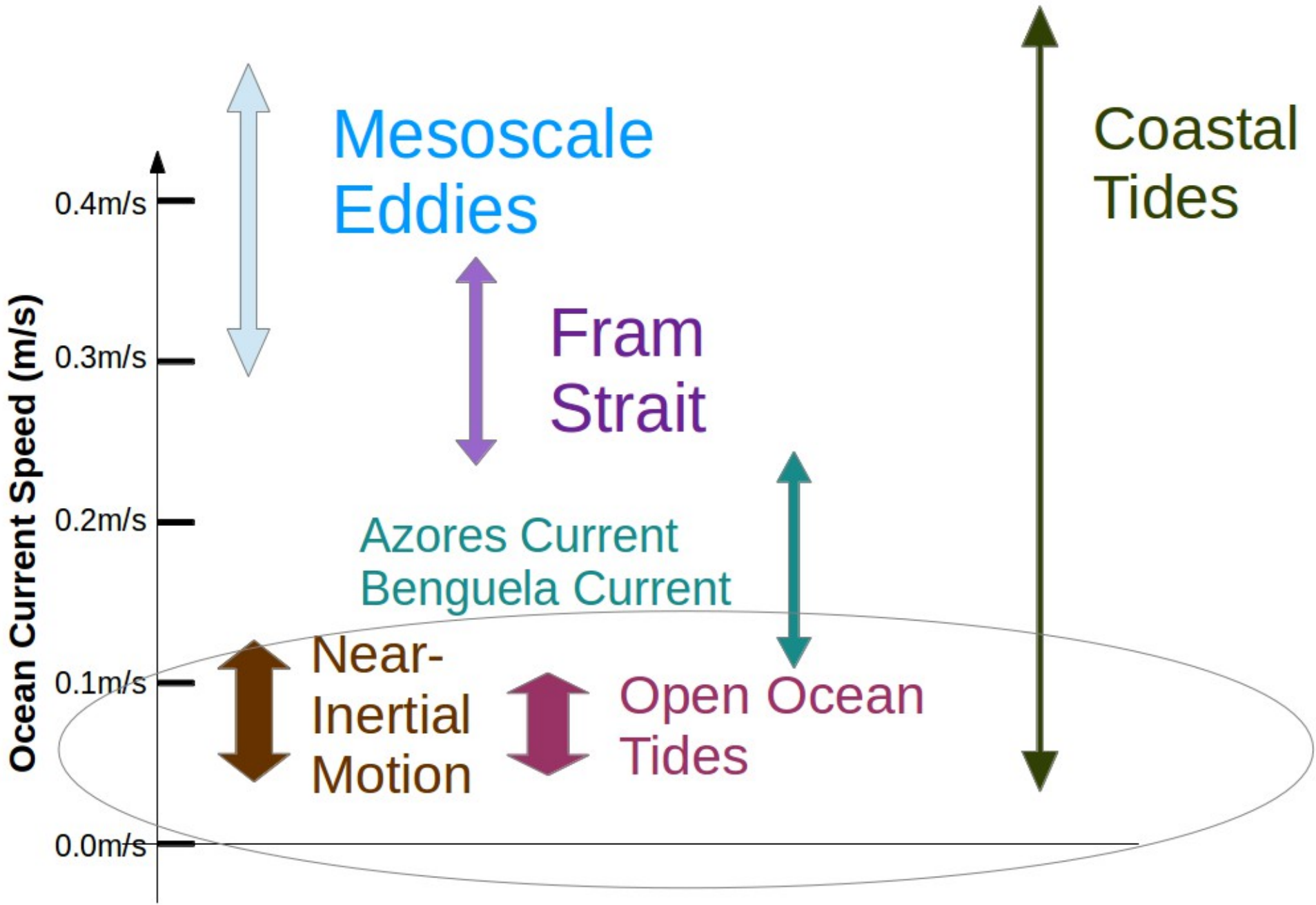
Heading Accuracy and ADCP data



primitive data

ocean velocities

Most Open Ocean currents are quite small; under 0.2m/s



Accurate Heading

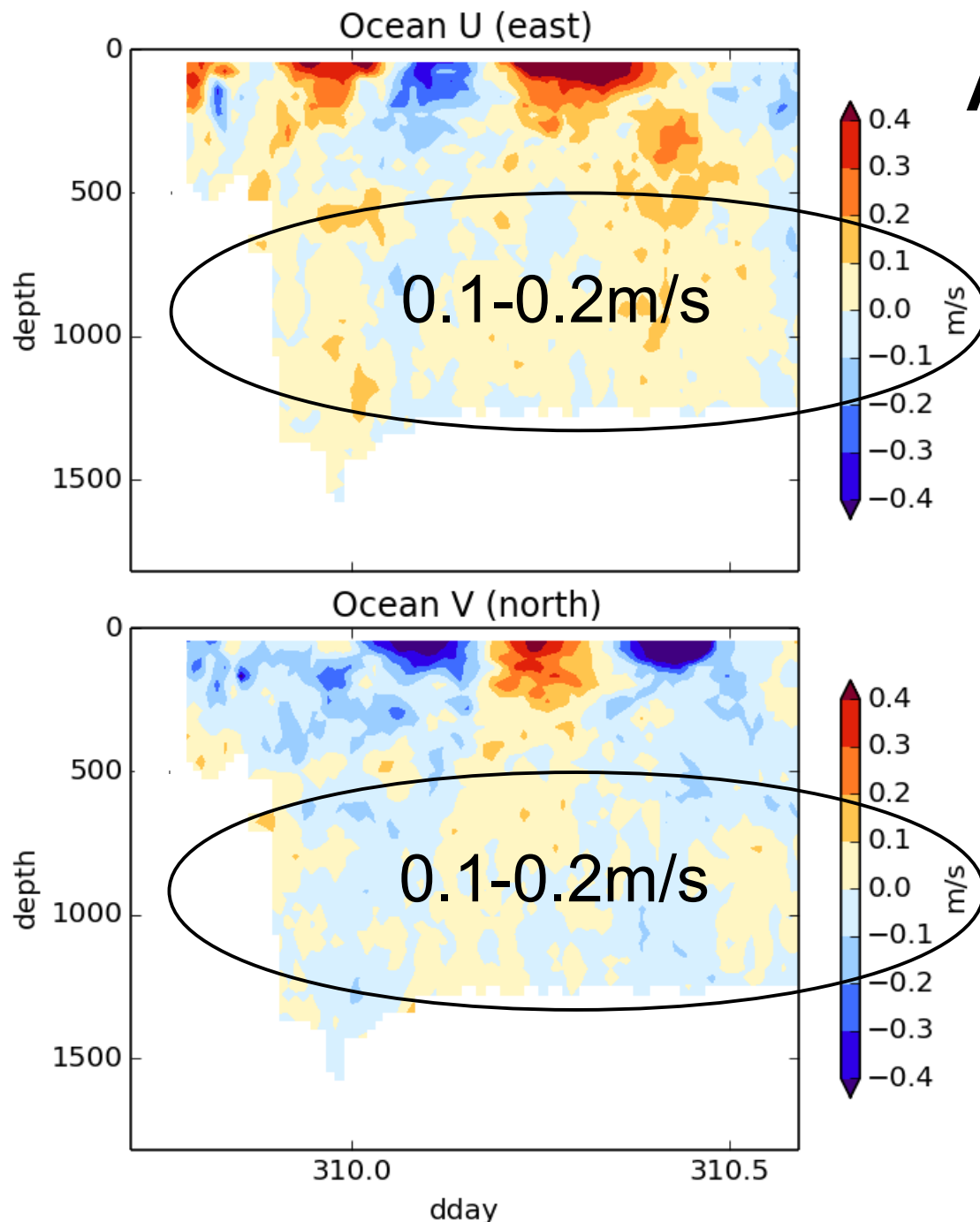
Typical subsurface open ocean speeds 0.1-0.2m/s

At 10kts:

1 degree heading error:

- cross-track direction
- 0.1m/s

REDUCE cross-track biases by using an accurate heading device, good to 0.1deg



os38nb: last time 2014/11/07 14:13:50

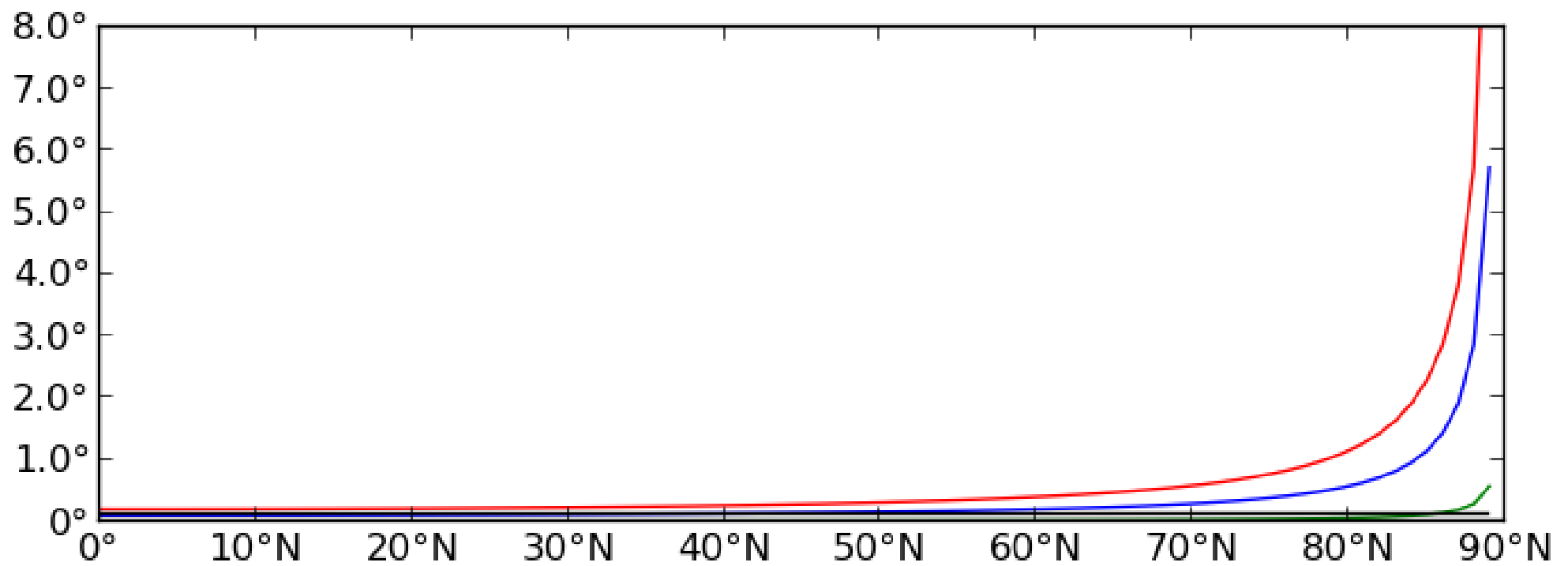
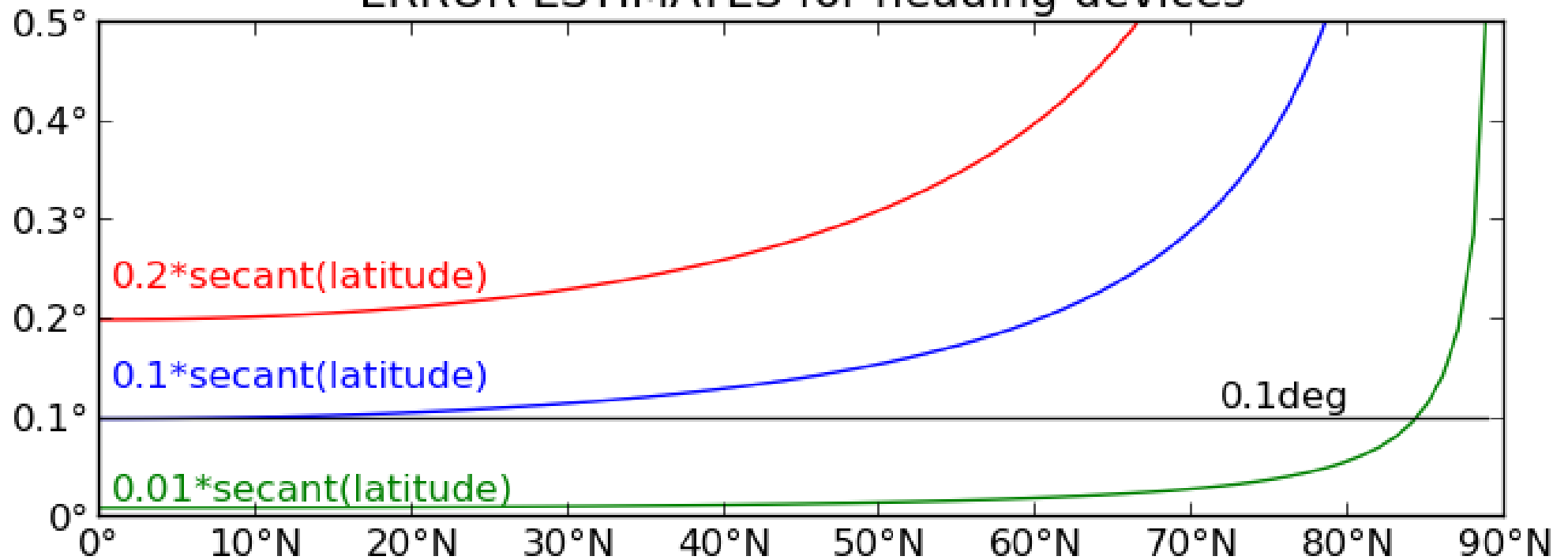
Evaluating Heading Accuracy

- direct comparison (heading1 - heading2)
- use QC flags within the messages: effective?
- ADCP bottom track calibration:

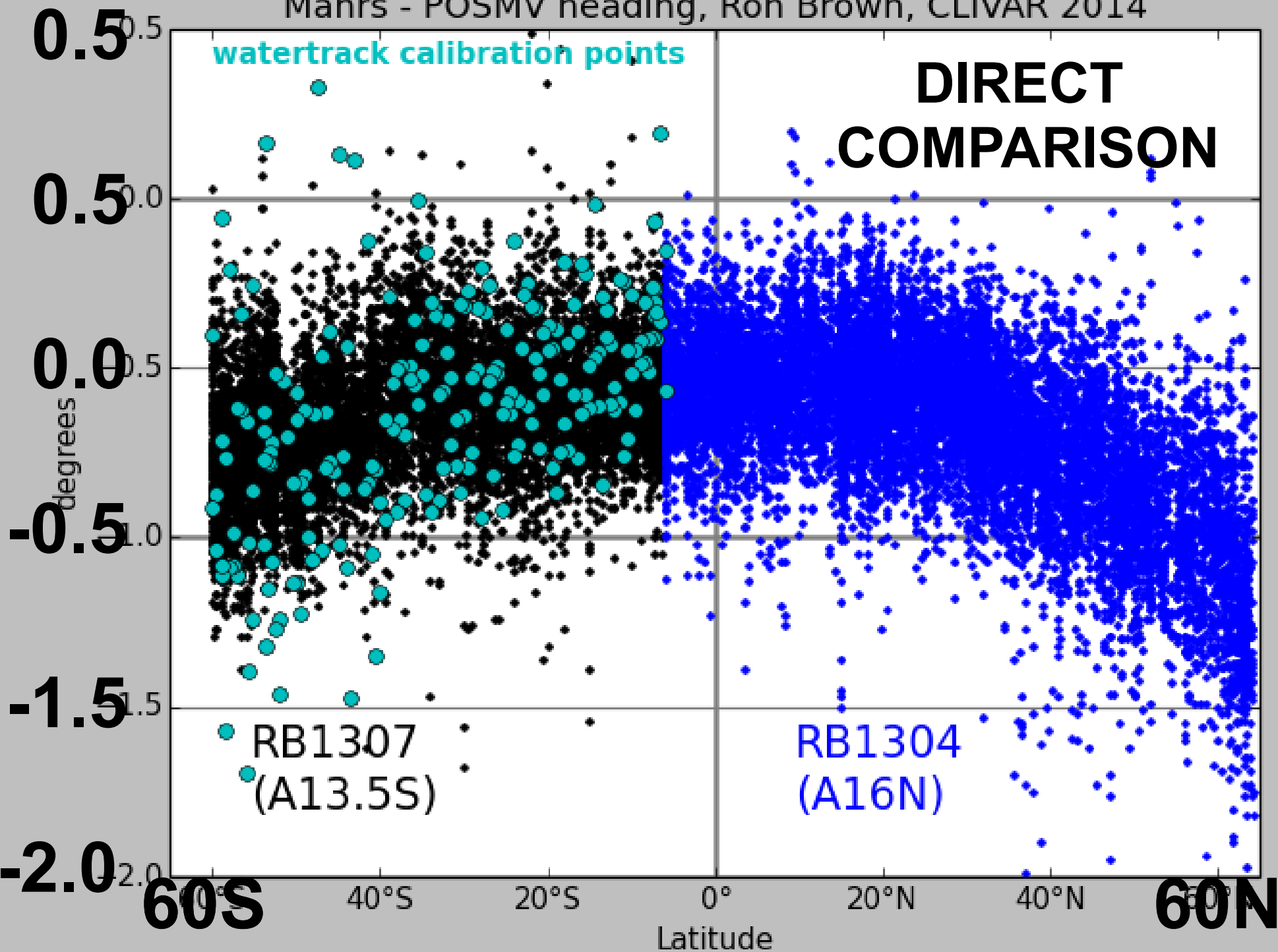
Use statistics of the estimates:

- small standard deviation of bottom track calibration means the angles did not vary much (more accurate)
- larger standard deviation means the heading has errors and bottom track calibration is not solid

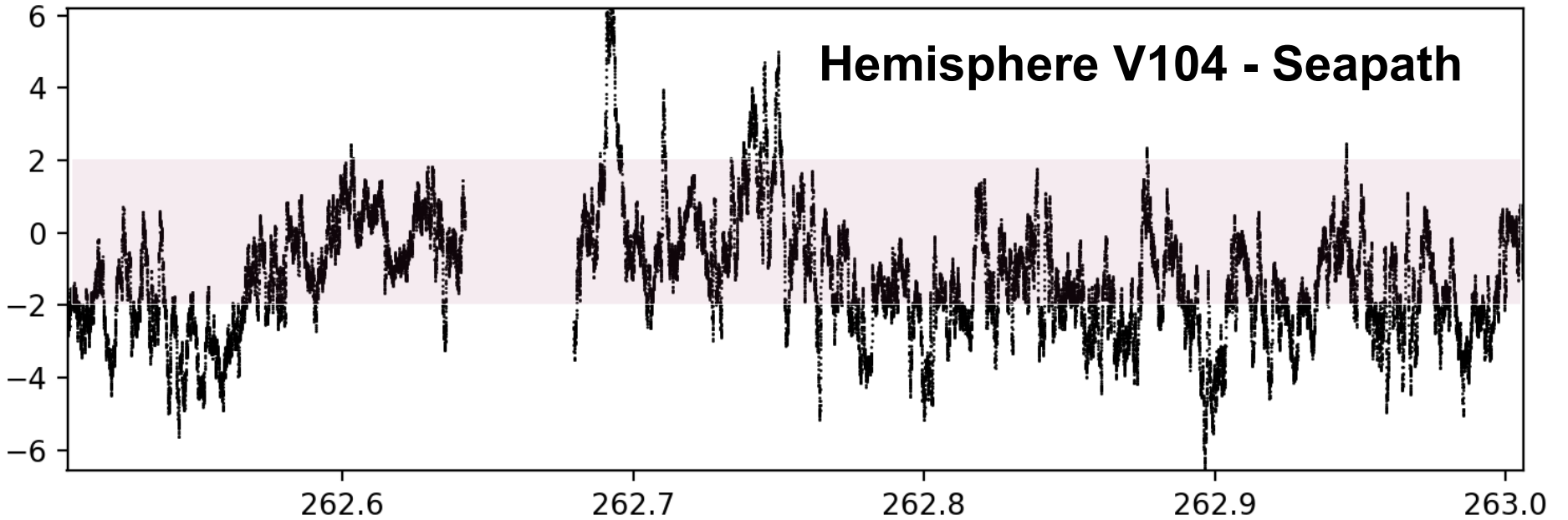
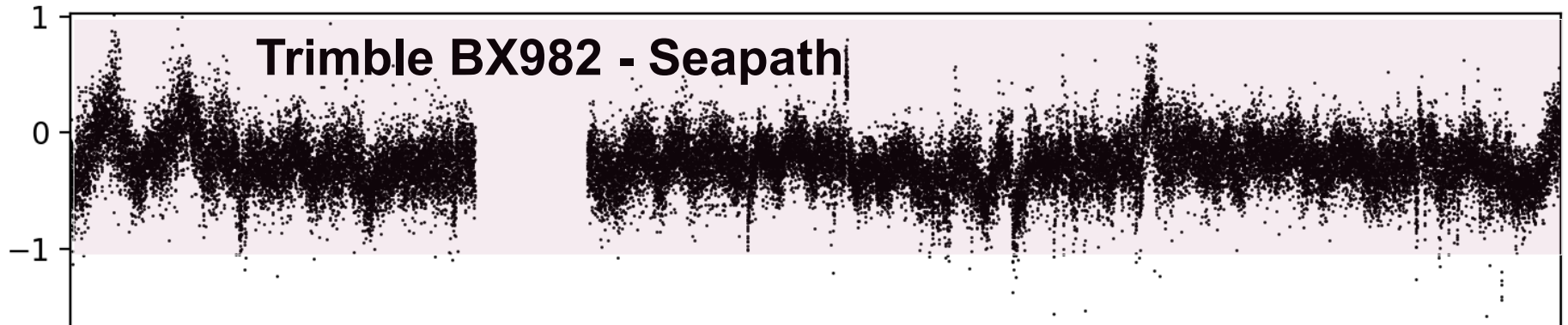
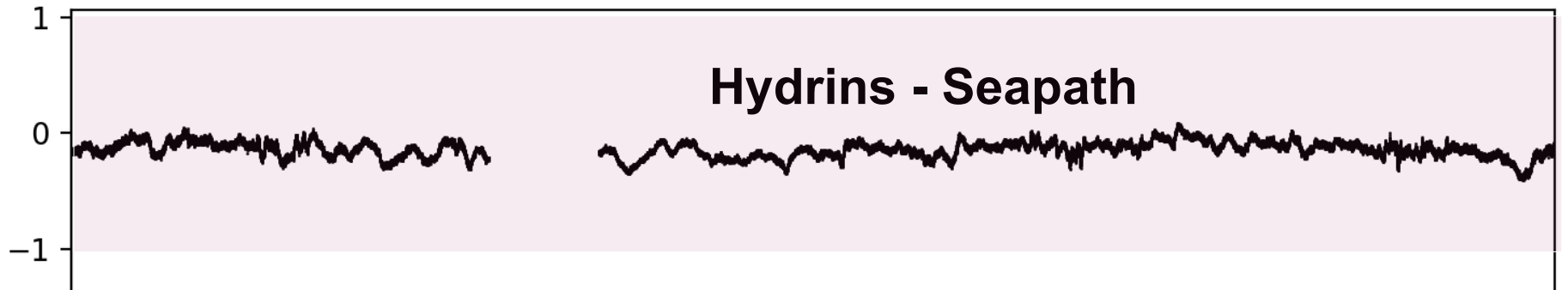
ERROR ESTIMATES for heading devices



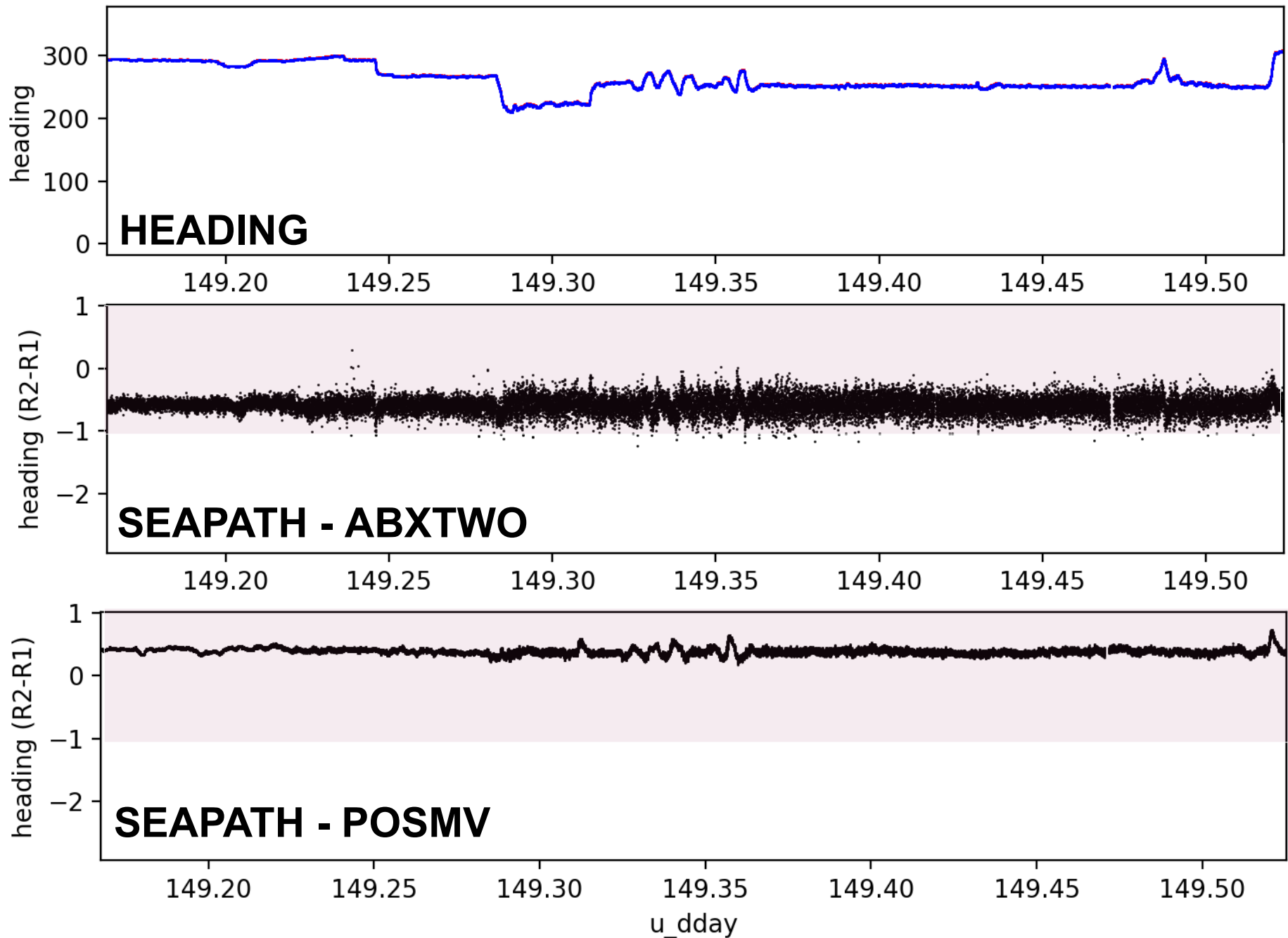
Mahrs - POSMV heading, Ron Brown, CLIVAR 2014



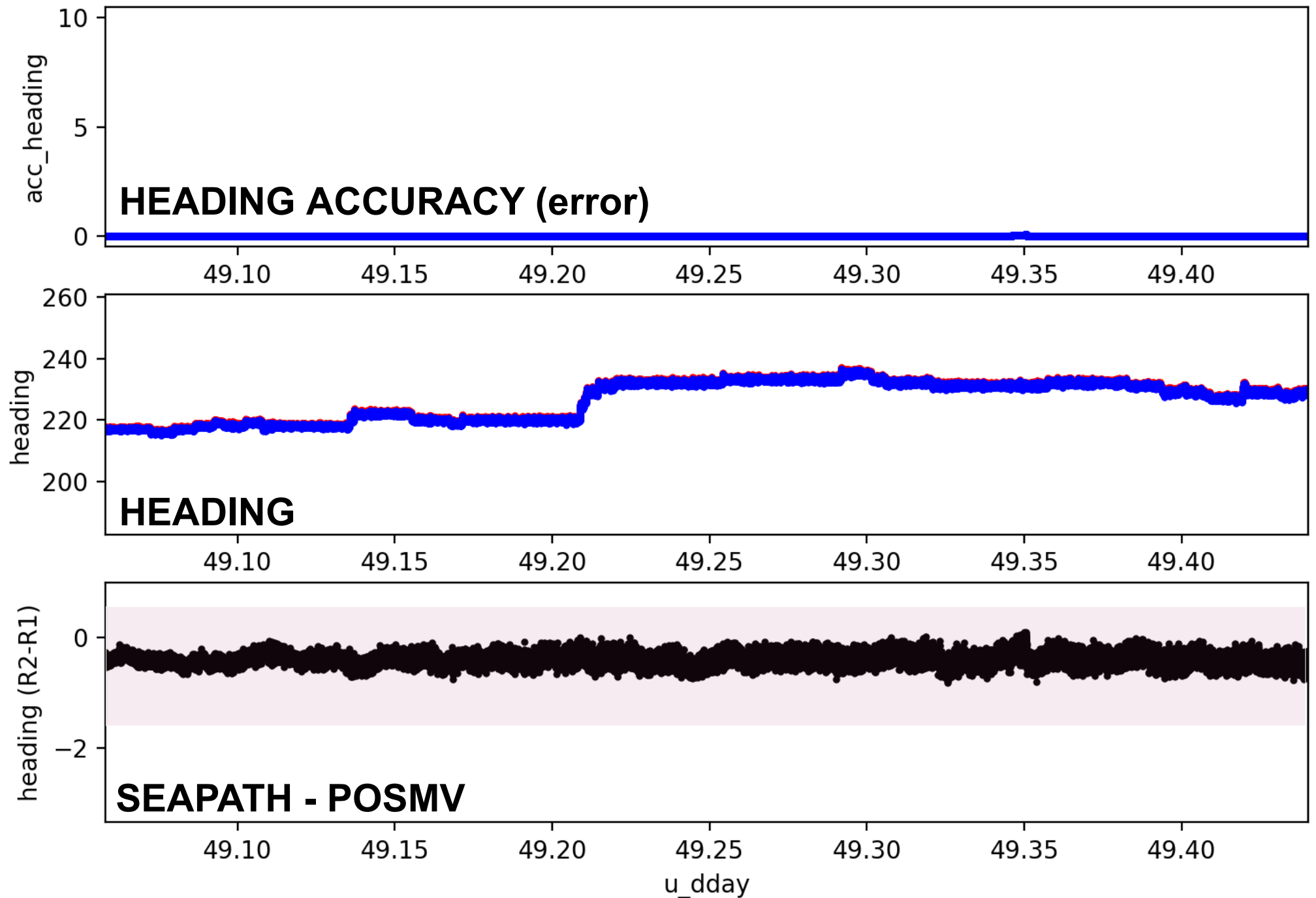
Sally Ride: Seapath, Hydrins, Trimble, Hemisphere



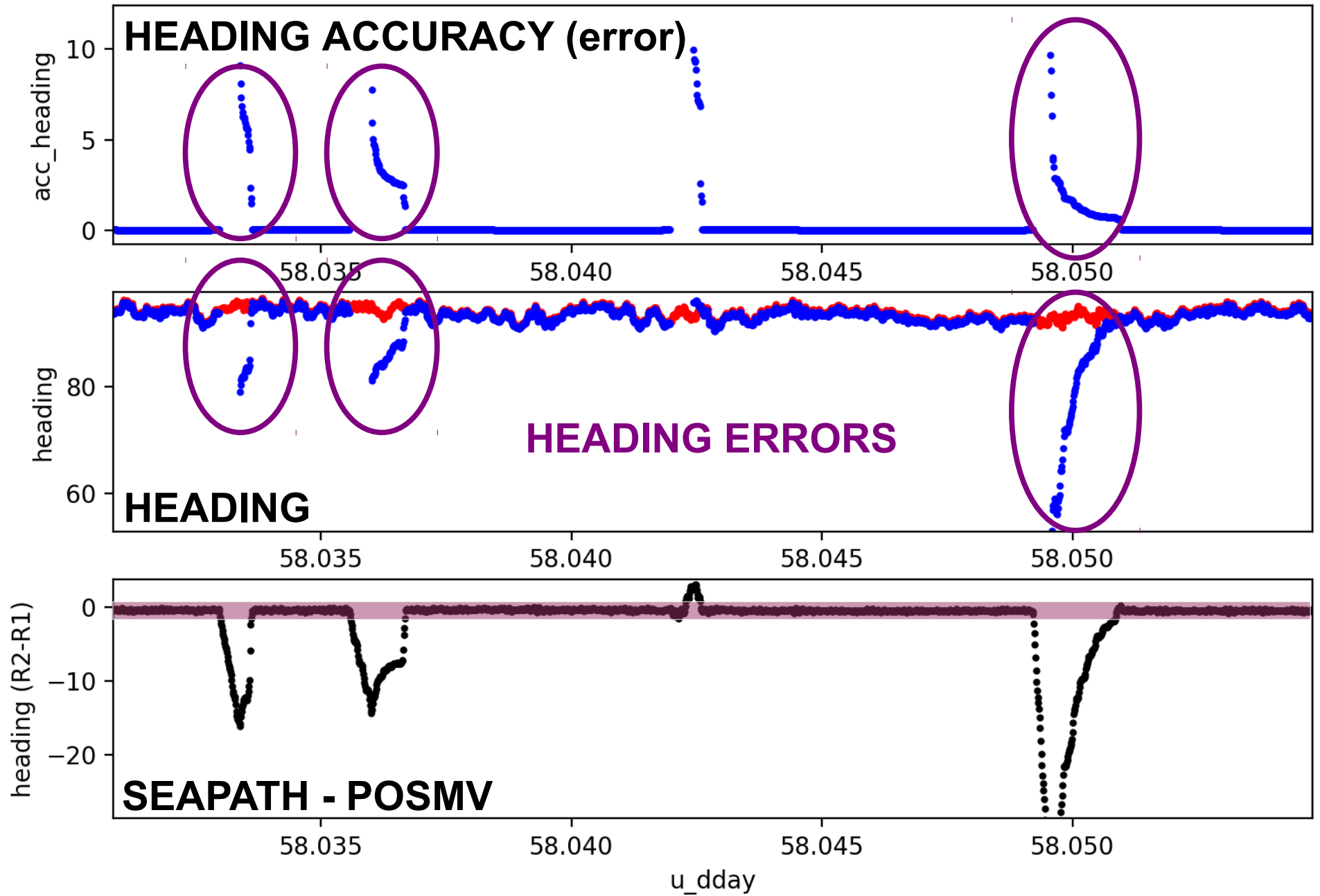
Healy: POSMV, Seapath, ABXTWO



Langseth: Seapath and POSMV

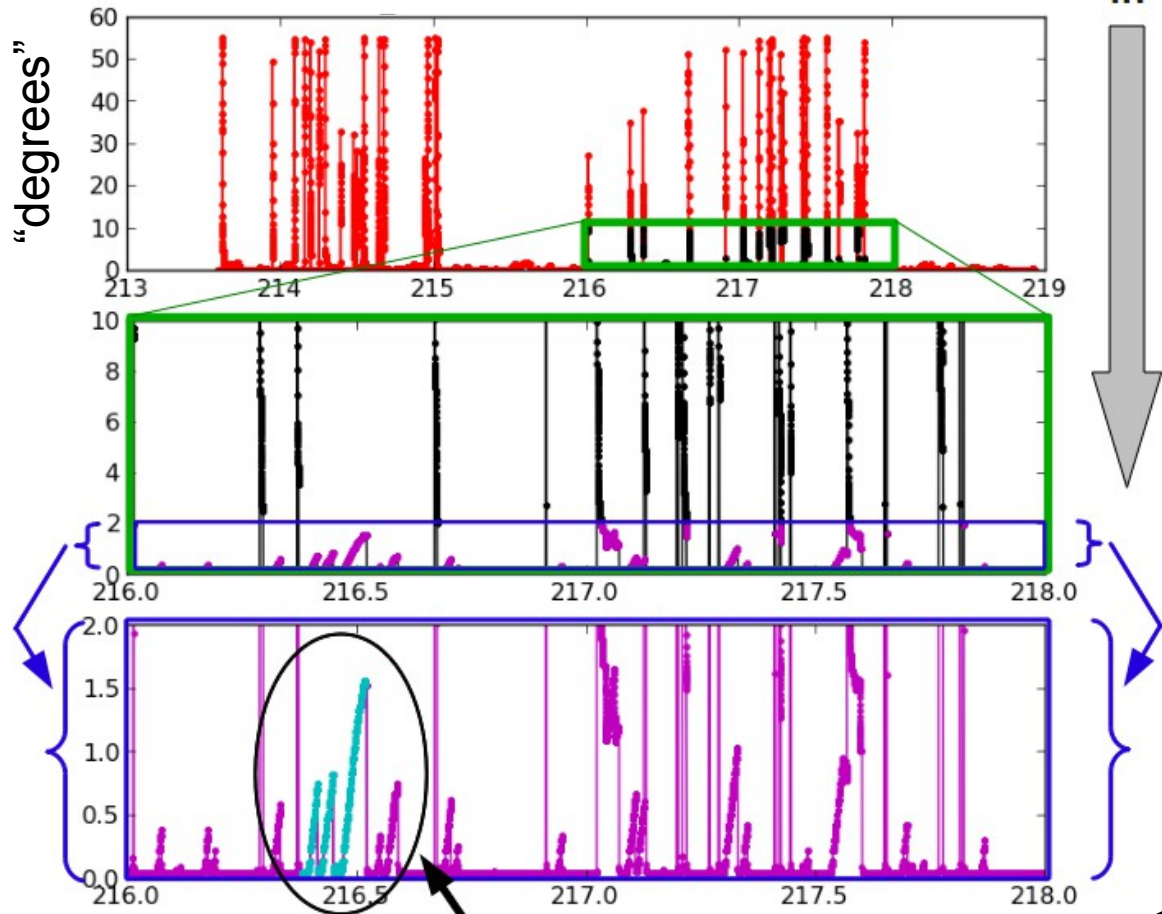


Langseth: Seapath and POSMV

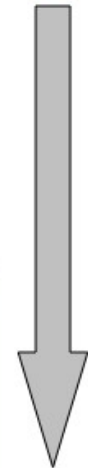


Always record Quality Flags

POSMV "heading accuracy" (\$PASHR)

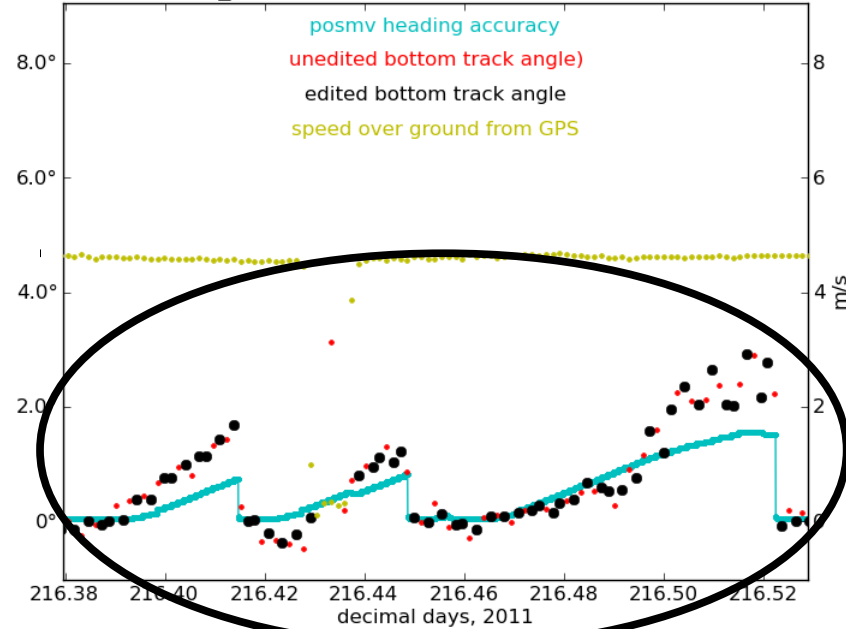


Zoom
in

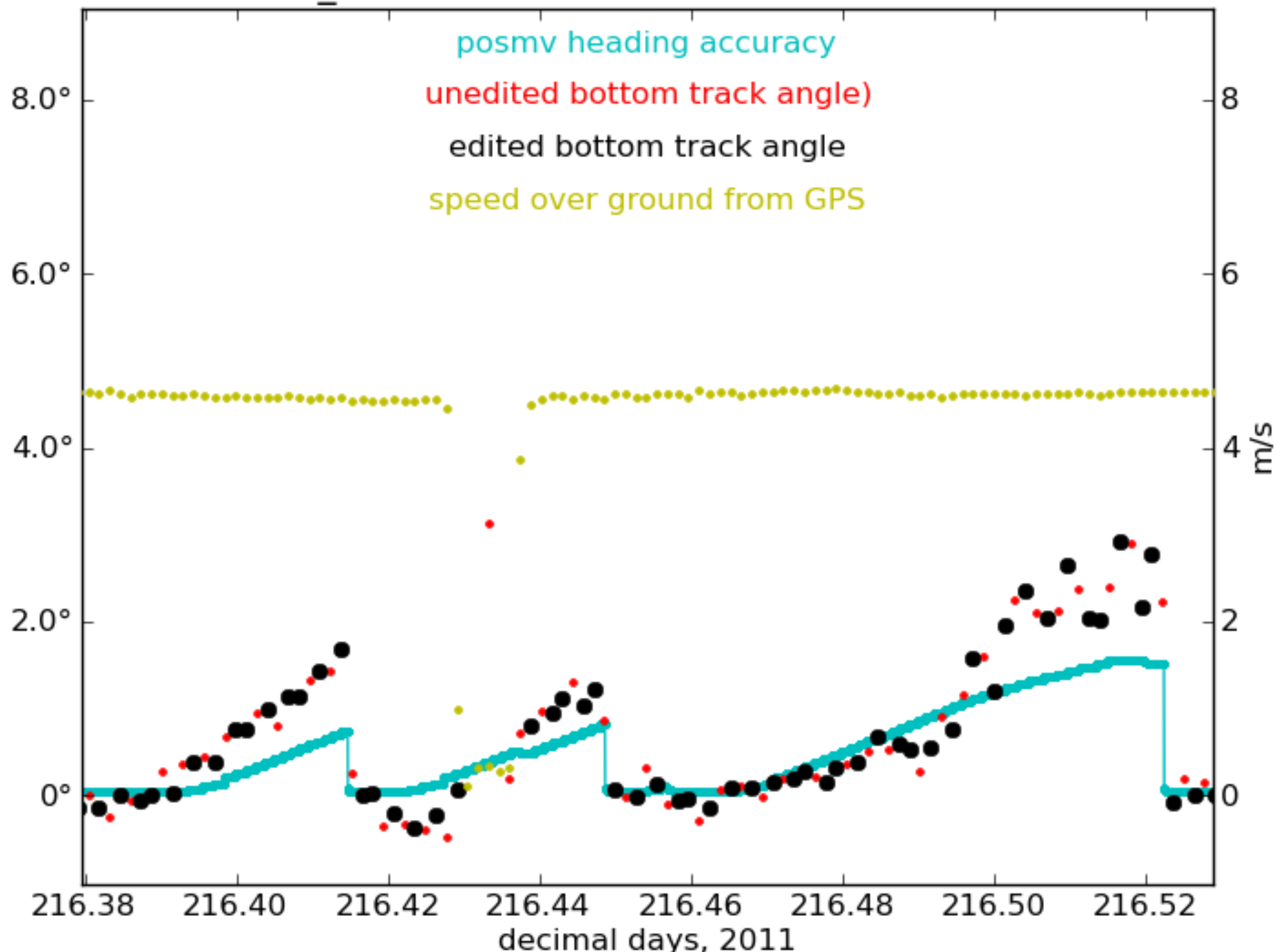


Bottom Track evaluation

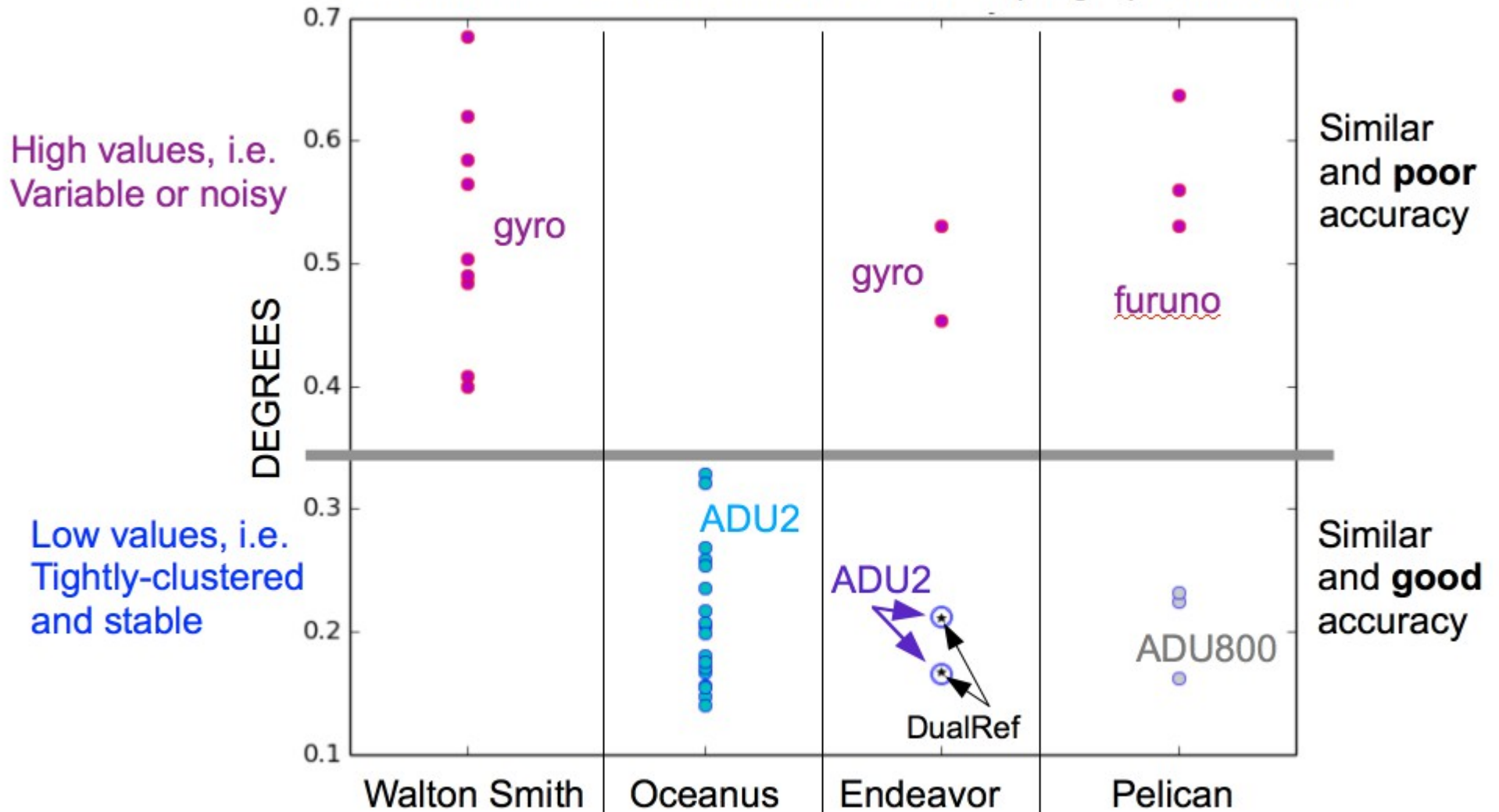
WS1114_bb600: bottomtrack and POSMV evaluation



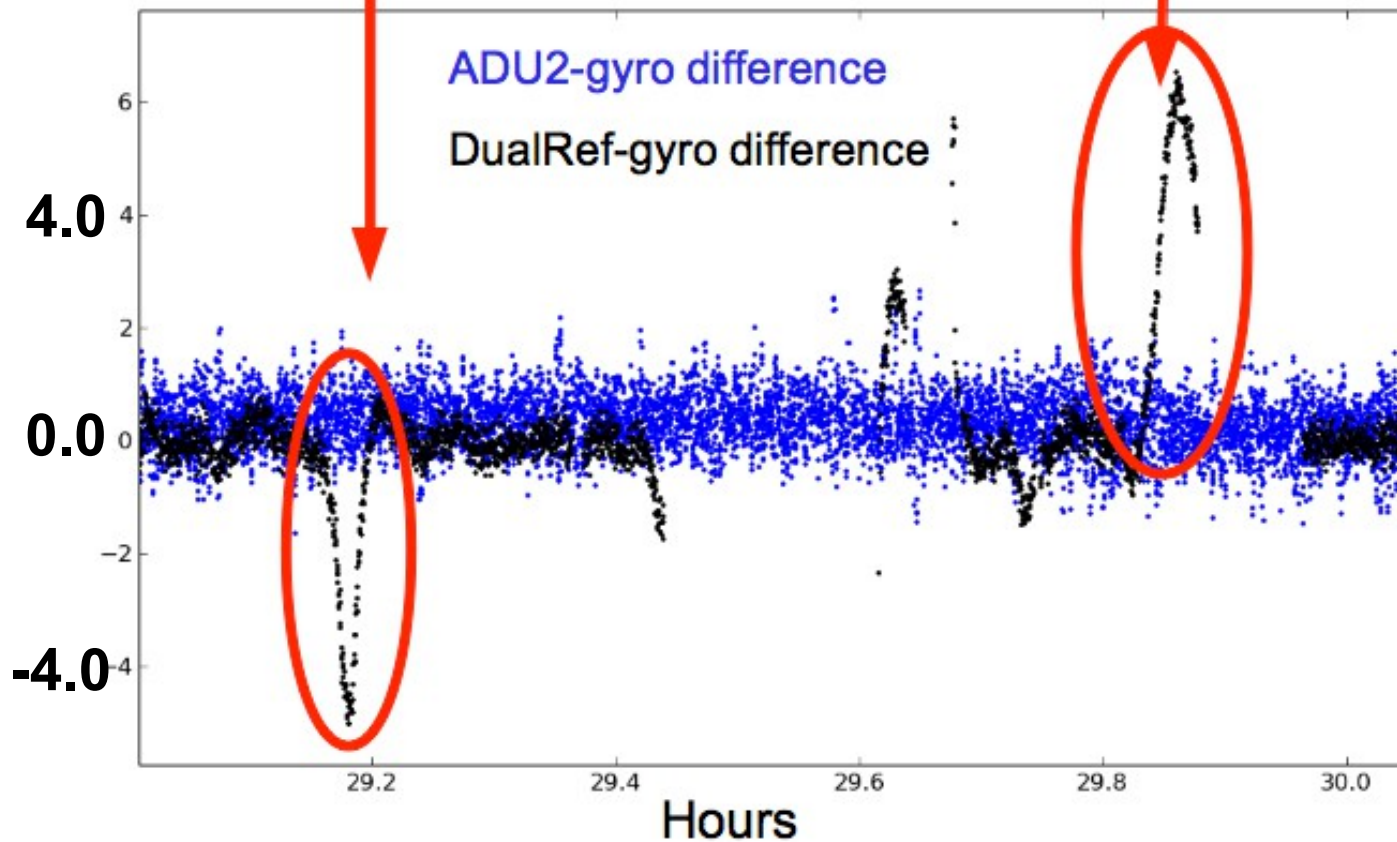
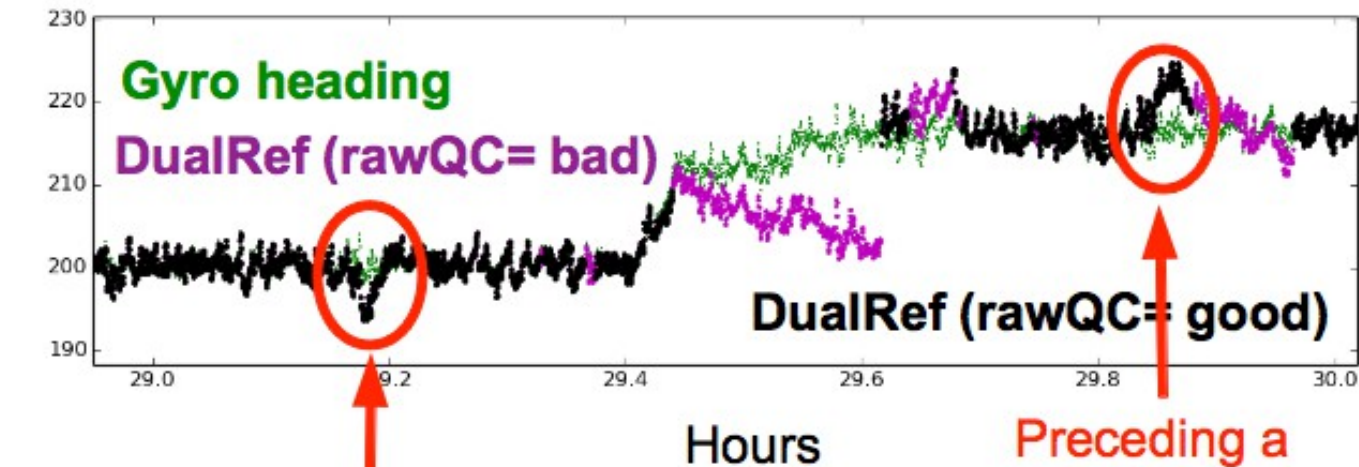
WS1114_bb600: bottomtrack and POSMV evaluation



Standard Deviation of Bottom Track (angle) calibration



Each dot represents
The standard deviation of
100-500 valid bottomtrack
phase calibration estimates
during one cruise



ADU2 and Spatial Dual comparison:

- similar cost (\$15K)
- ADU2 (4 GPS)
- Spatial Dual
 - 2 GPS
 - tilt sensors
 - accelerometers

QC indicators:

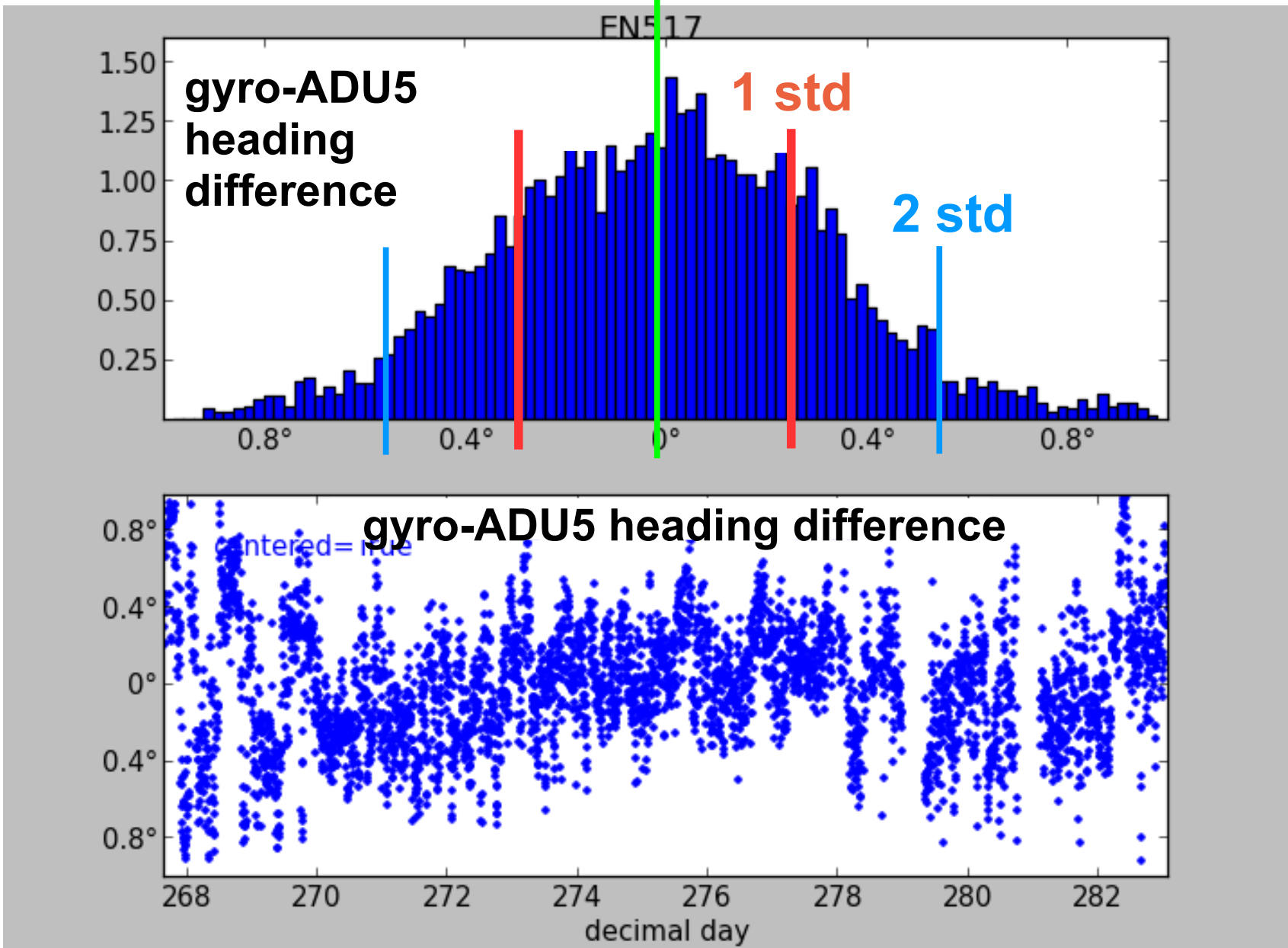
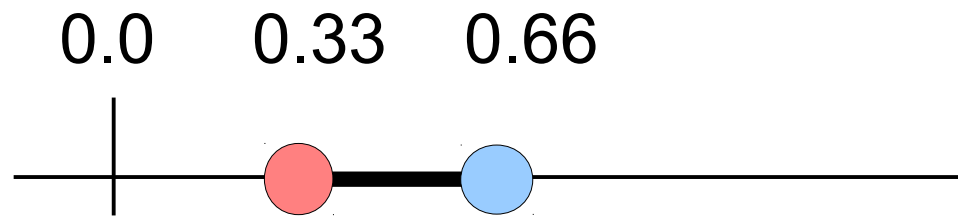
- ADU has "good/bad"
- Spatial Dual has "standard dev" est

Always use QC

Often need

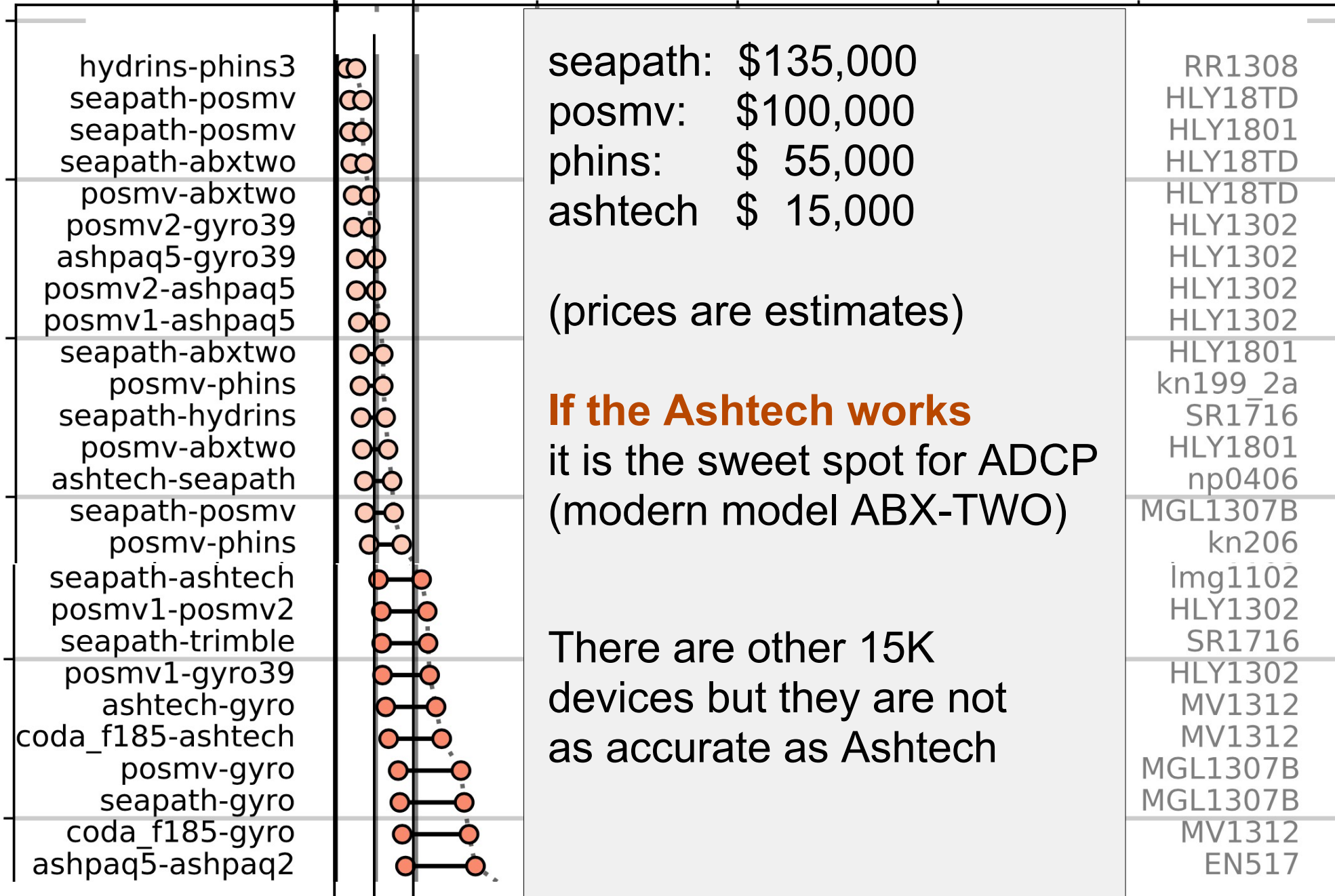
- comparison
- additional algorithms

plot 1 and 2 standard deviations



Heading comparison – accurate or very accurate

0.0 0.2
0.1



seapath: \$135,000

posmv: \$100,000

phins: \$ 55,000

ashtech \$ 15,000

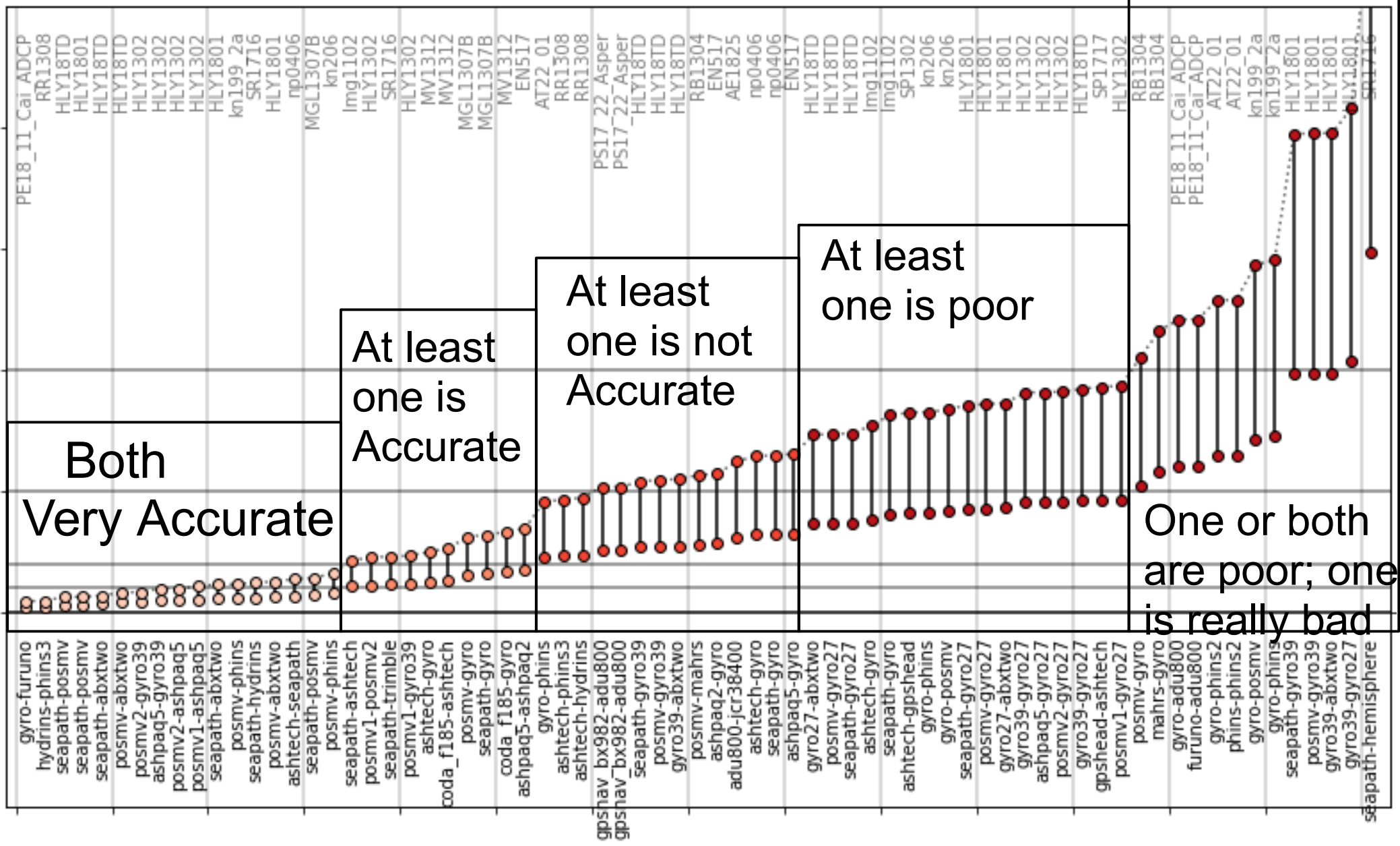
(prices are estimates)

If the Ashtech works

it is the sweet spot for ADCP
(modern model ABX-TWO)

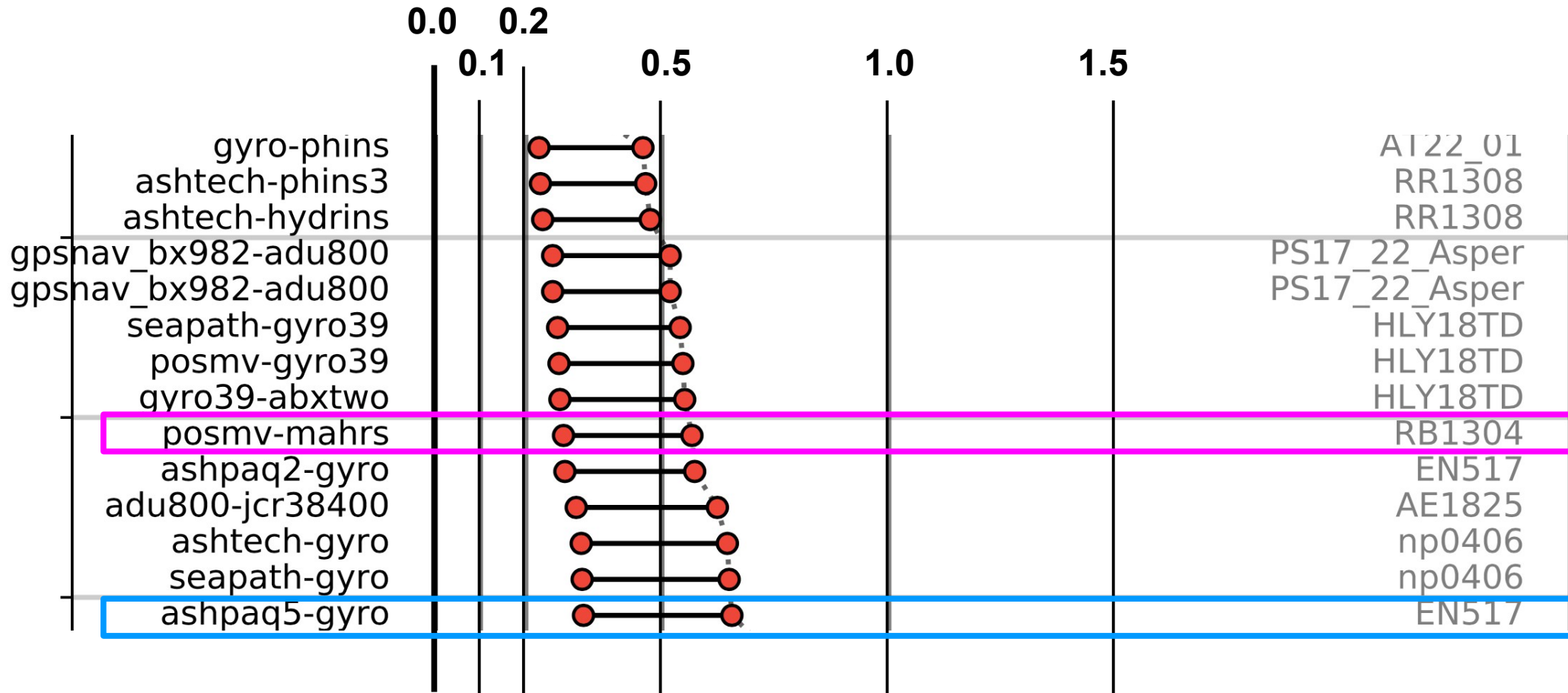
There are other 15K
devices but they are not
as accurate as Ashtech

1-2 stddev(ADCP heading correction) i.e. 5-min edited dh

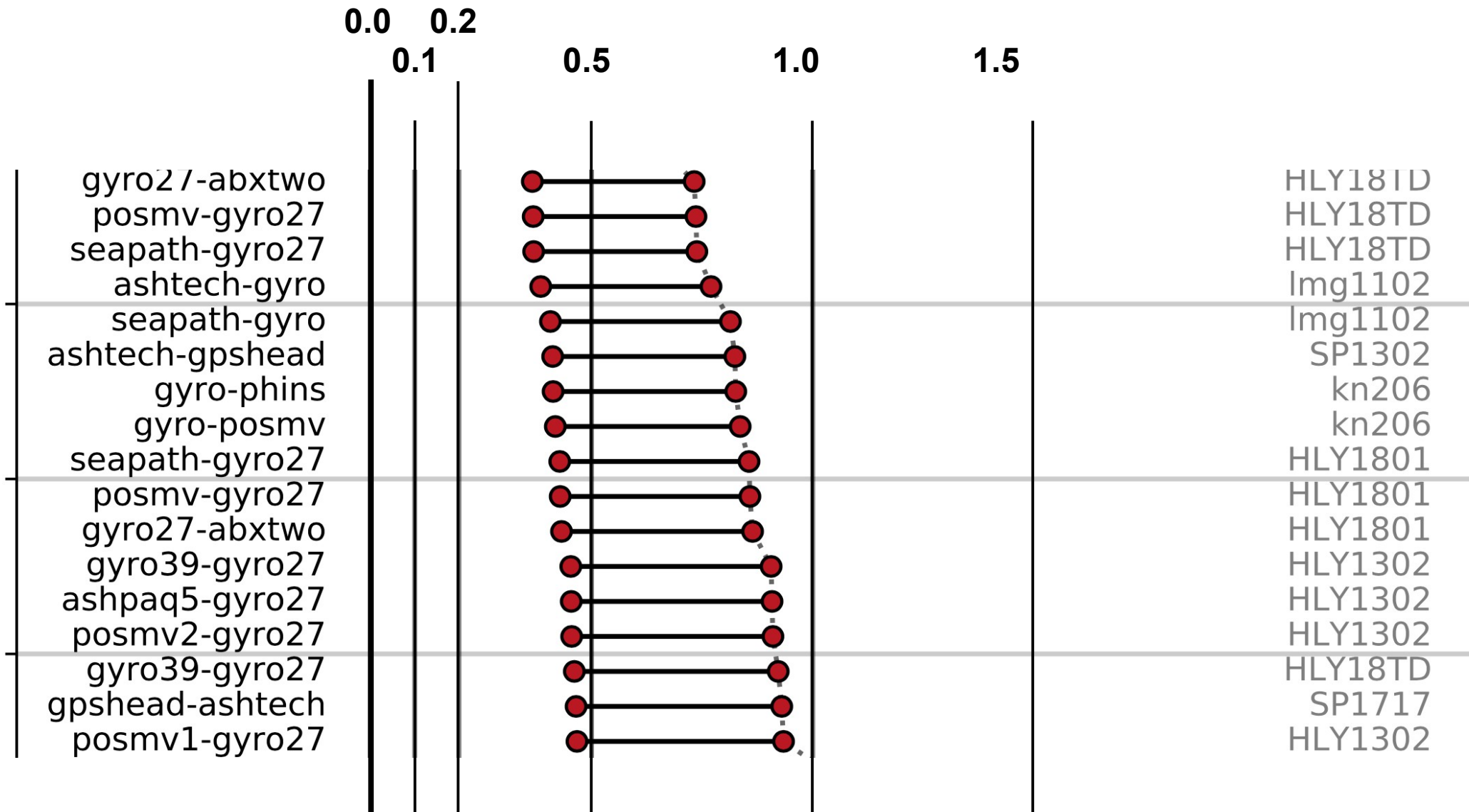


The rest of the slides were
not shown in the talk

Heading comparison – at least one is not accurate



Heading comparison – at least one is poor



Heading comparison – both are poor; one is really bad

