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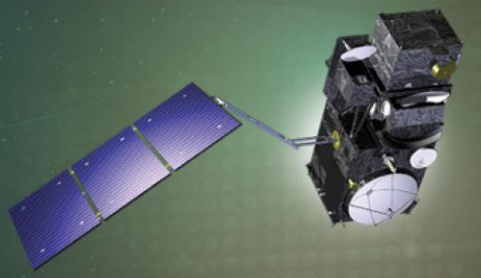

7th Sentinel-3 Validation Team Meeting 2022

18-20 October 2022 | ESA-ESRIN | Frascati (Rm), Italy

Updated altimeter validation results for Sentinel-3A/3B from Bass Strait, Australia

Christopher Watson[1,2] (cwatson@utas.edu.au), Benoit Legresy[3,2], (Benoit.Legresy@csiro.au), Jack Beardsley[2], Arthur Zhou[1], Andrea Hay[1].

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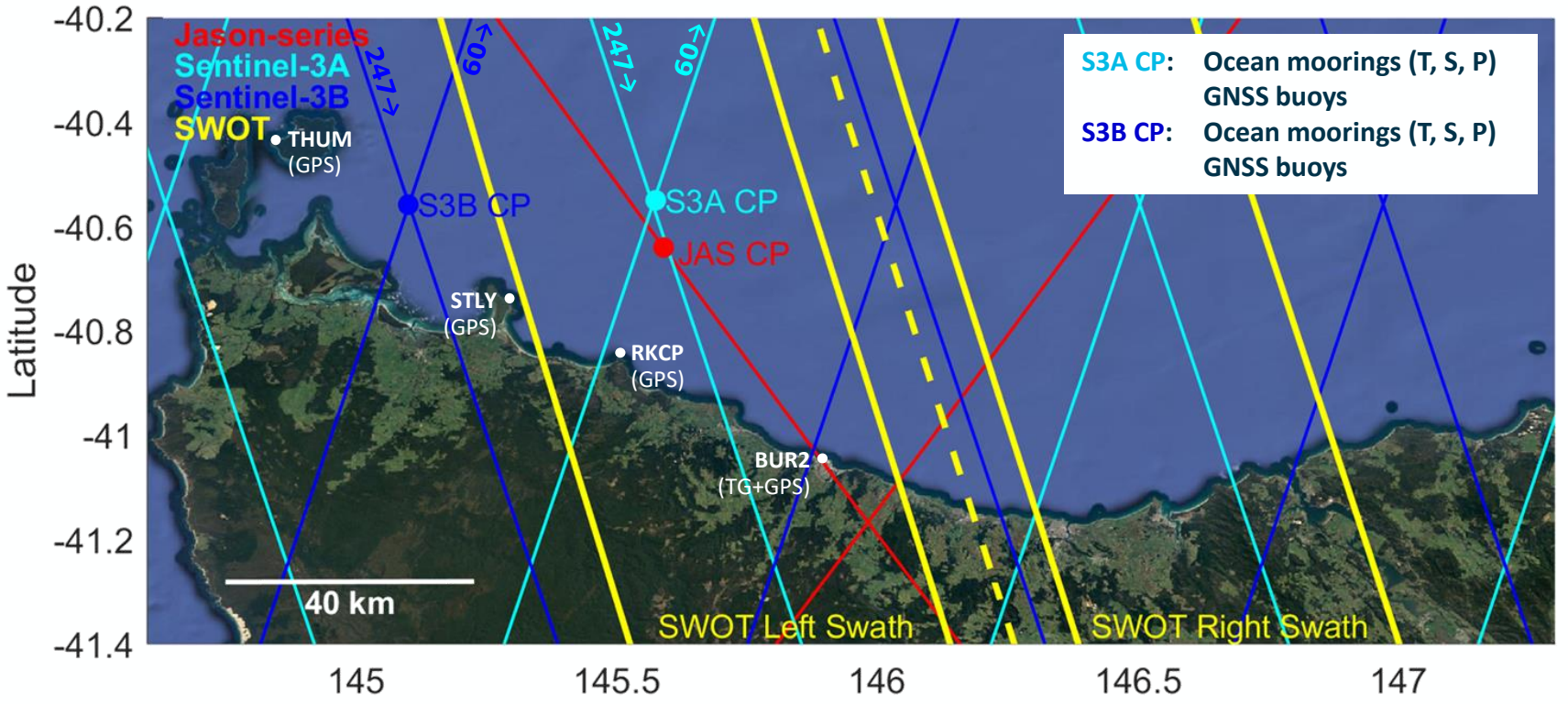
2. Integrated Marine Observing System
3. CSIRO Oceans and Atmosphere, Hobart, Australia.

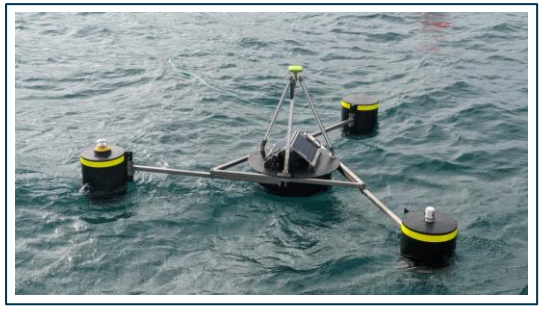
Bass Strait Validation Facility

- **Sustained in situ absolute validation of satellite altimetry in Bass Strait, Australia, since the launch of TOPEX-Poseidon.**
- **This presentation: Updated absolute bias results for non-time critical SSH data from S3A and S3B (PB04 and 05).**
- **Both comparison points are located at cross overs of passes 060 and 247 (see S3A CP and S3B CP).**



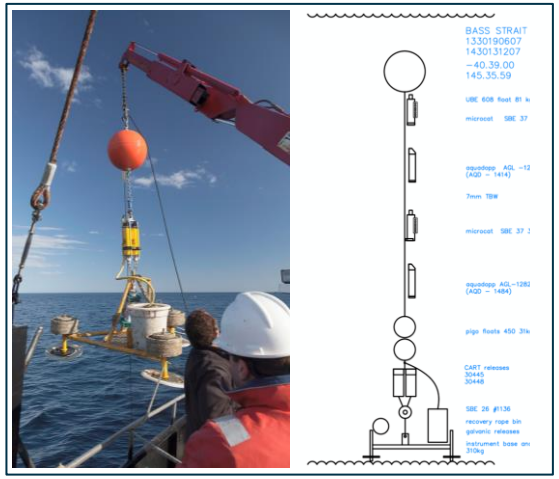
Approach

- **Direct, geometric approach to in situ validation.**
- **Key in situ observations at the respective S3A and S3B comparison points.**



GNSS/INS Equipped Buoys

- Deployed episodically at cross overs to determine absolute datum of in situ SSH time series.
- Extended to now include inertial sensors (INS) for orientation.



Moored Sensors

- Bottom pressure, temp and salinity to determine continuous SSH time series (datum defined by GNSS buoys).
- New current, waves, pressure inverted echo sounders (CWPIES) yield high and low frequency SSH as well as currents.

Tide Gauge / cGNSS

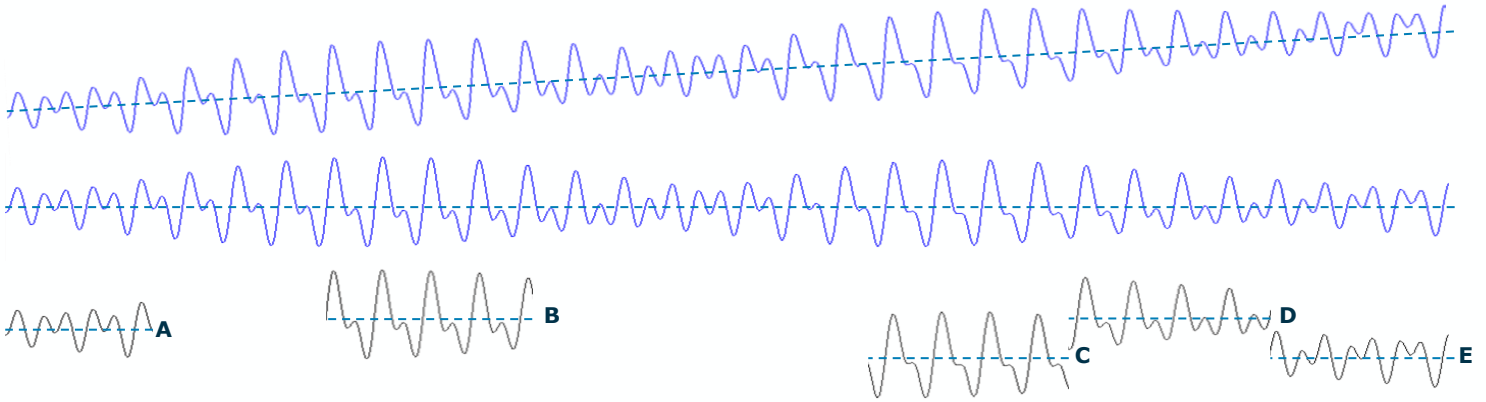
- "Climate quality" coastal tide gauge.
- Numerous inland GNSS to provide vertical land motion (VLM).
- Inland GNSS used in differential processing of buoys given favourable geometry.
- GNSS offer insight into spatial/temporal evolution of troposphere.

Approach

Tide gauge
(RSL)

Tide gauge
(VLM removed via land GPS)

Mooring (P, T, S or PIES) Deployments
(Different arbitrary datums based on deployment depth)



Approach

Tide gauge
(RSL)

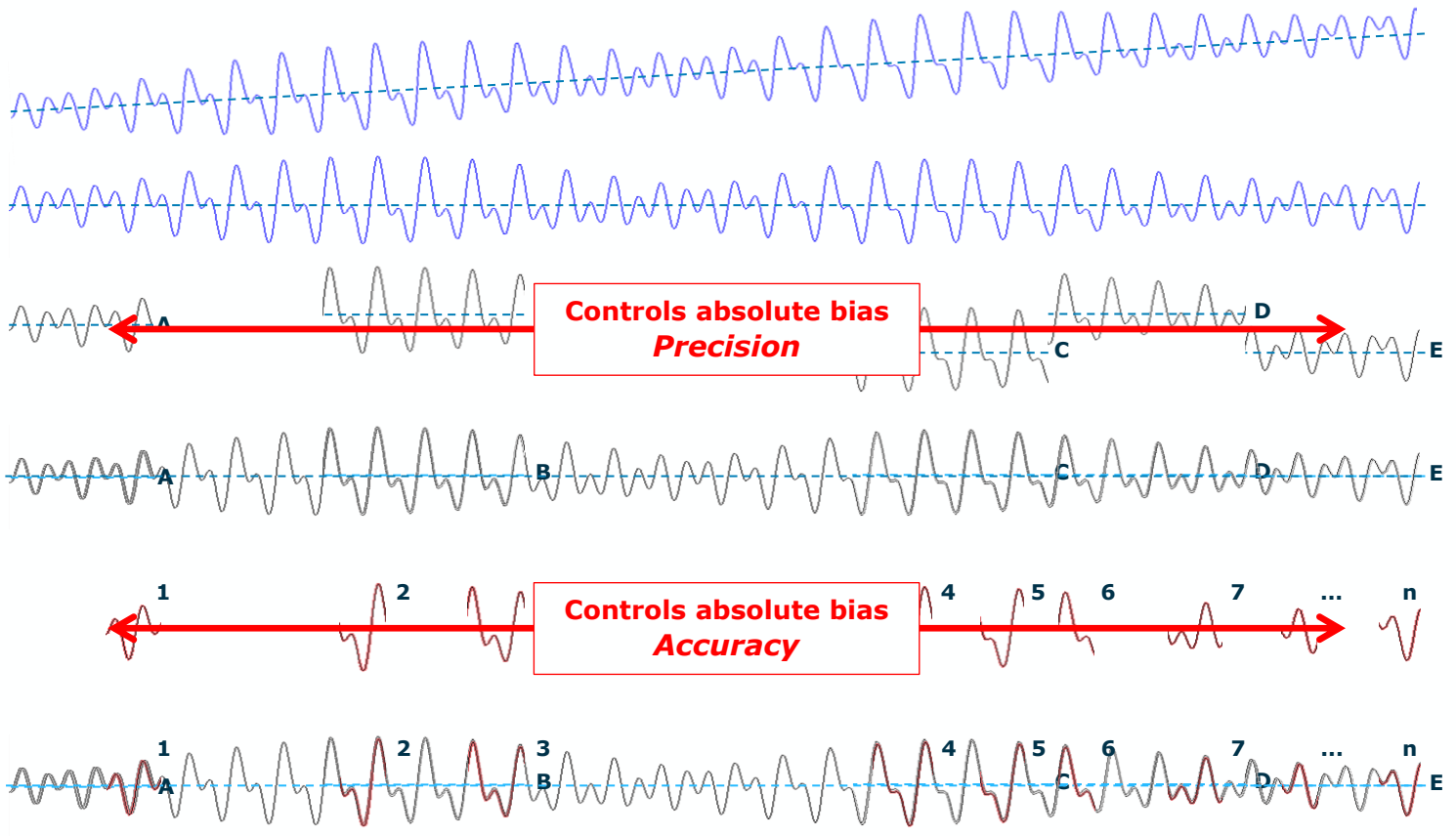
Tide gauge
(VLM removed via land GPS)

Mooring (P, T, S or PIES) Deployments
(Different arbitrary datums based on deployment depth)

Tide gauge RSL
(tidally corrected to mooring location)
Mooring RSL
(on arbitrary TG datum)

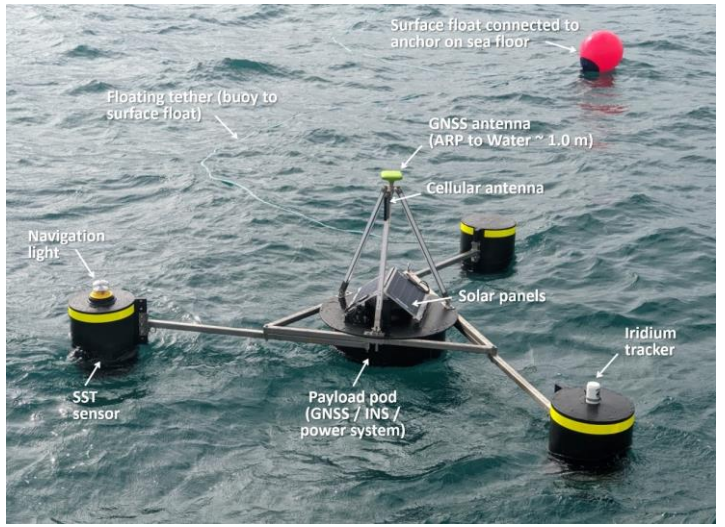
GNSS Buoy Deployments
(on ITRF2014 datum)

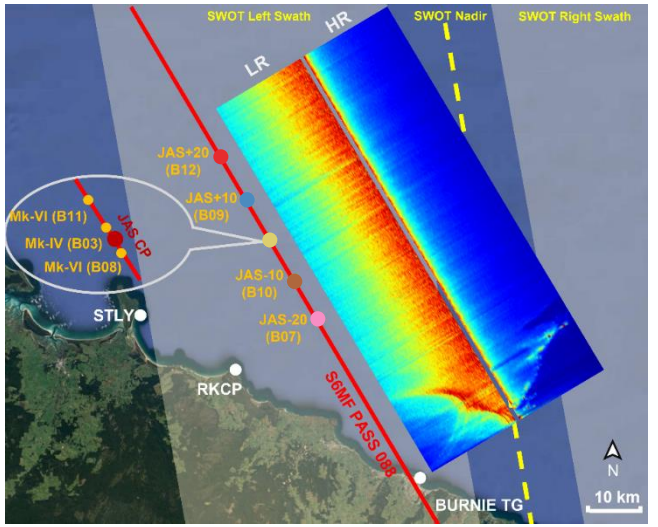
***In Situ* SSH ON DATUM**

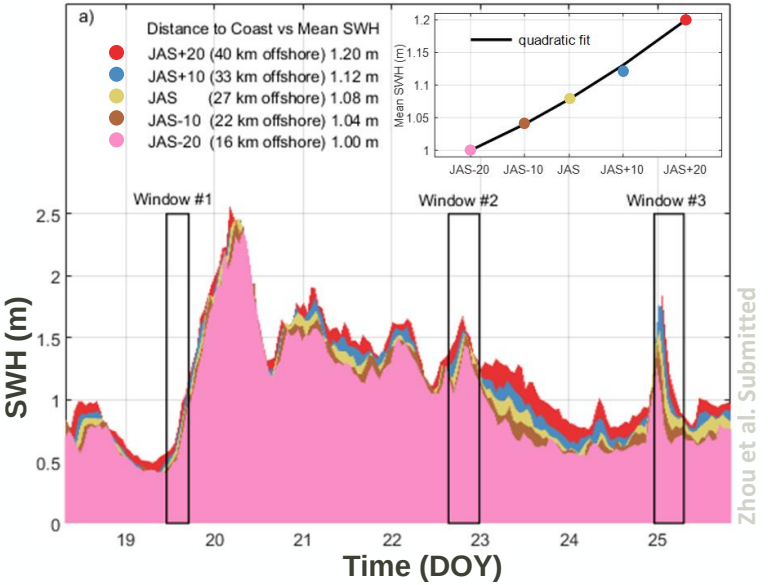


Progress with In Situ SSH at Bass Strait

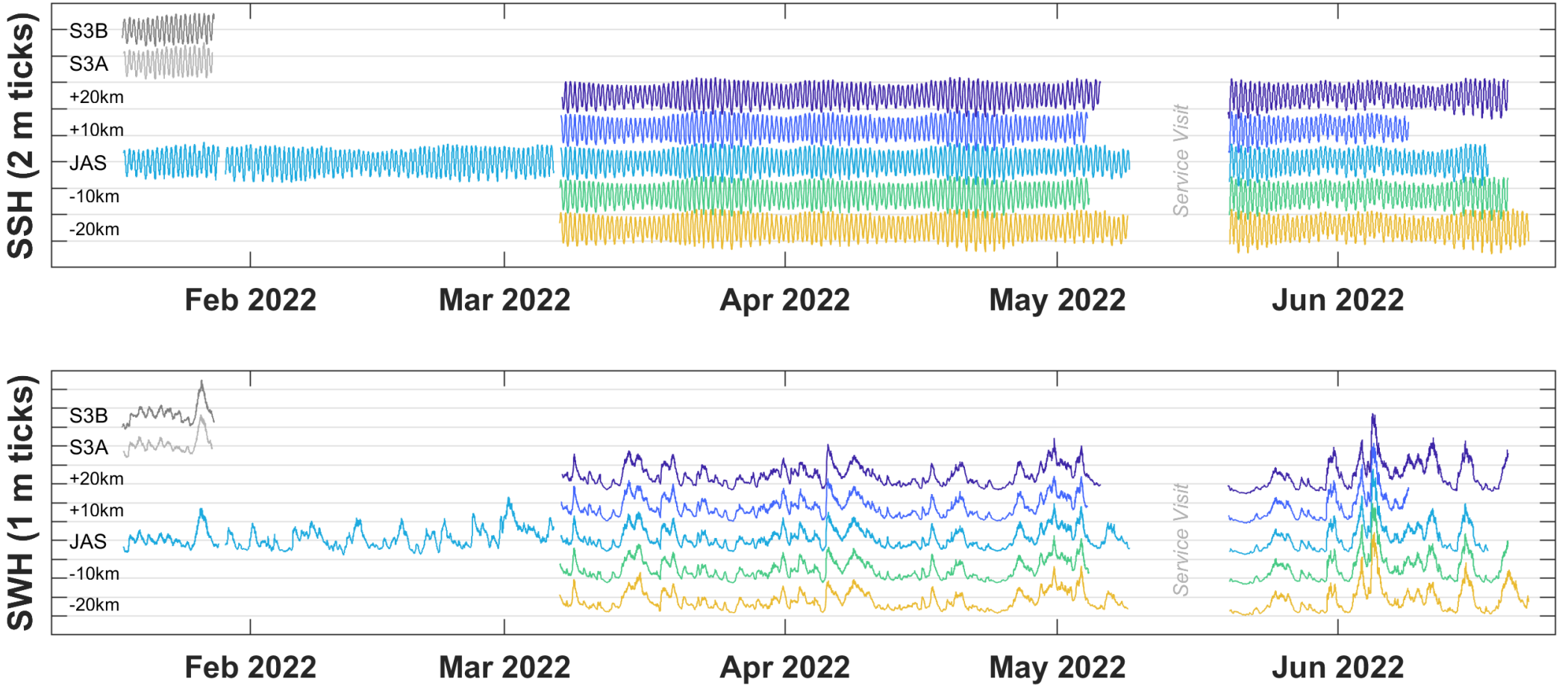
- **Advancing altimeter performance requires further understanding and development of in situ SSH observation techniques.**
- **We have successfully tested a GNSS buoy array at 10 km spacing in Bass Strait. (Zhou et al, Submitted).**
- **Currently assessing against new sub-surface T/S/P and CWPIES moorings.**







Progress with In Situ SSH at Bass Strait

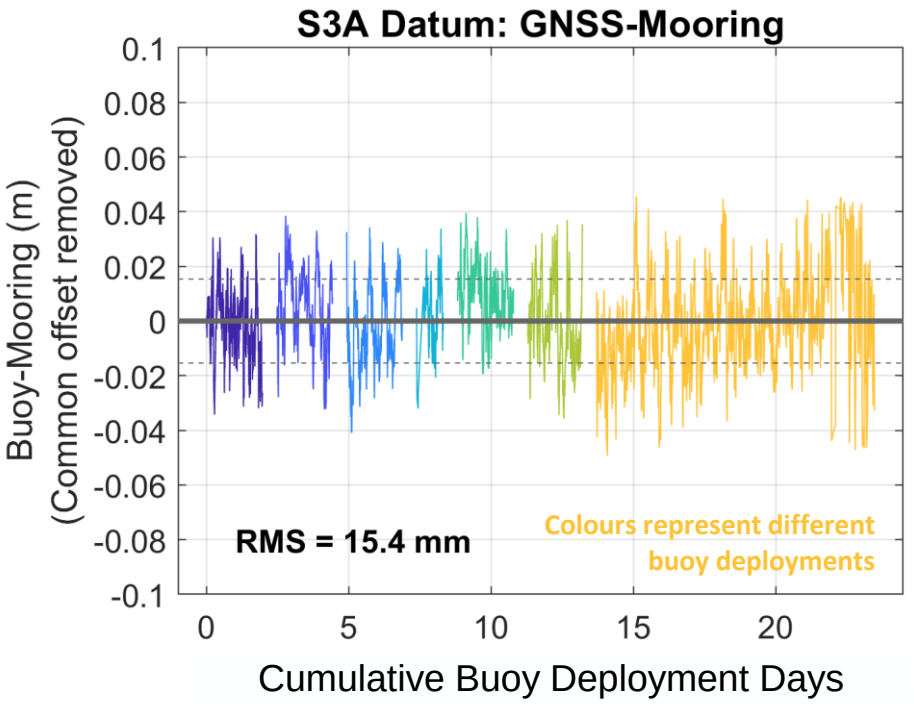


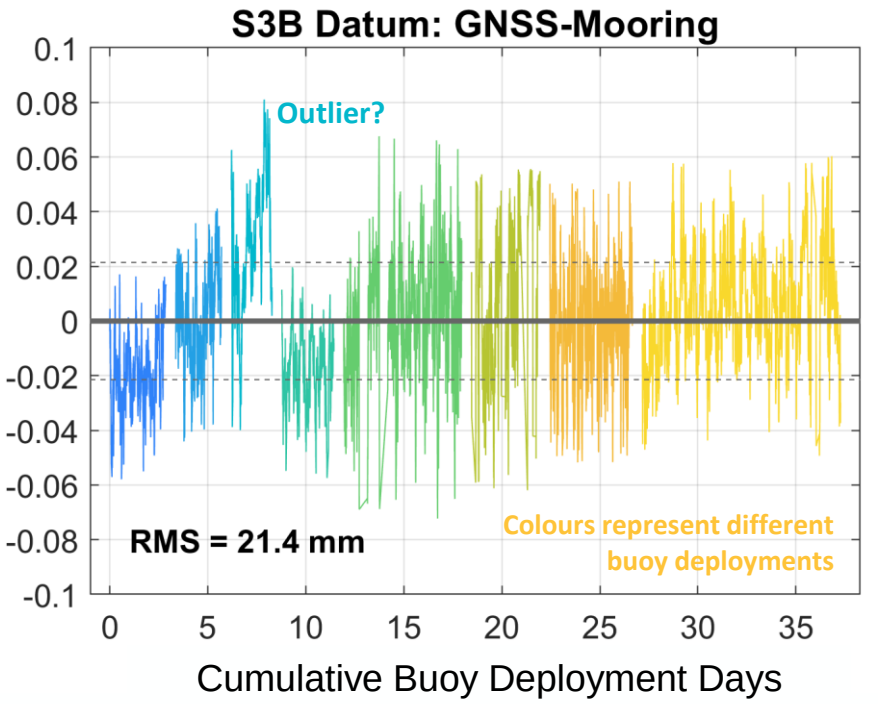
Results:

- Mooring datum stability against GNSS buoys.
- S3A SAR and PLRM absolute bias. PB04/05.
  - SAR v PLRM relative bias
- S3B SAR and PLRM absolute bias. PB04/05.
  - SAR v PLRM relative bias
- Comparison of absolute bias from mooring/buoy compared to coastal tide gauge.

Results: Mooring Datum Stability

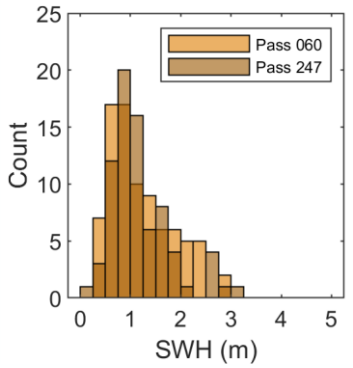
- We detrend each ~6 to 12 monthly mooring SSH against the tidally corrected coastal tide gauge.
- We then determine the average offset of this series against multiple buoy deployments. The variability about this common offset is shown here.
- For comparison: at the reference missions comparison point, the RMS = 18 mm.

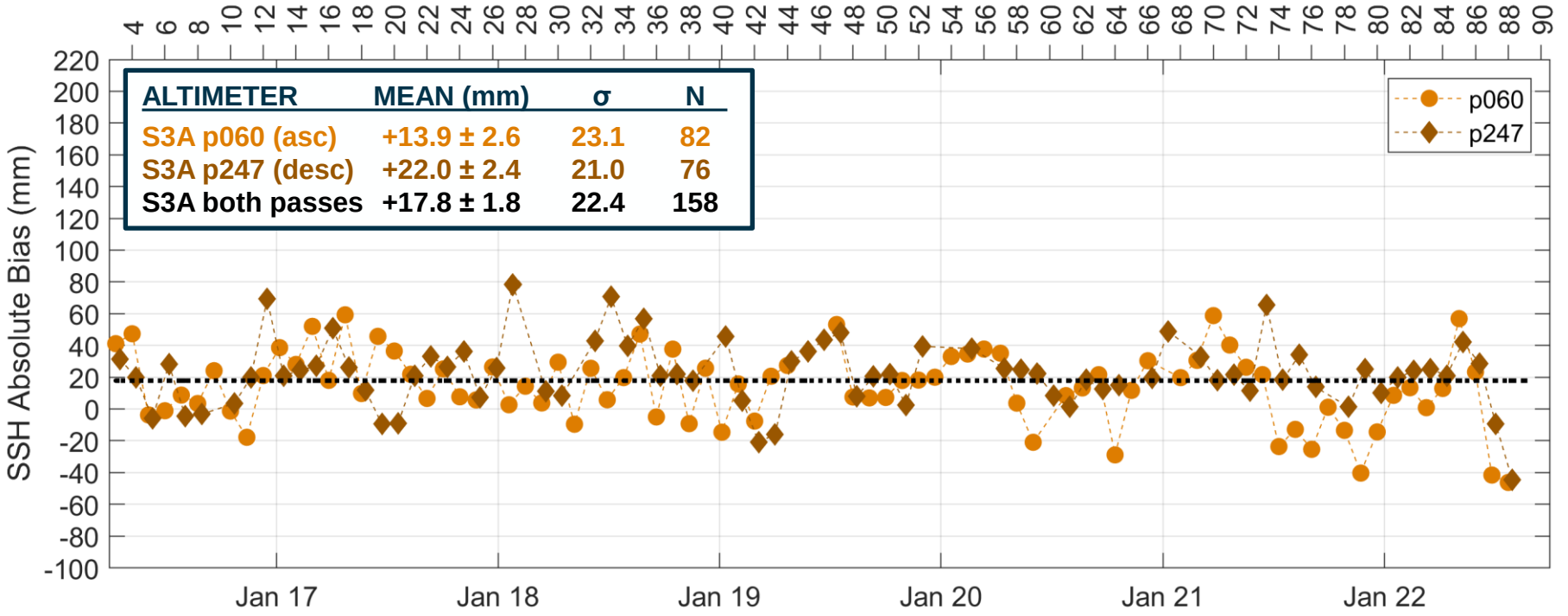




Results: S3A SAR Absolute Bias

- **PB04/05. Compared here against in situ SSH at the S3A cross over.**
- **Absolute bias and variability is at the ~2 cm level.**
- **Trend from robust linear fit is insignificant (-1.2 ± 1.9 mm/yr).**

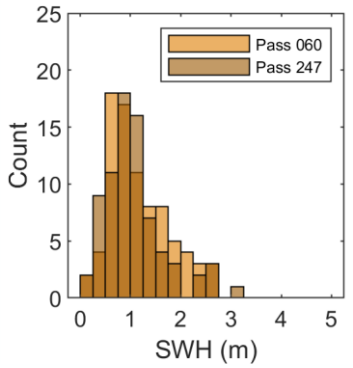


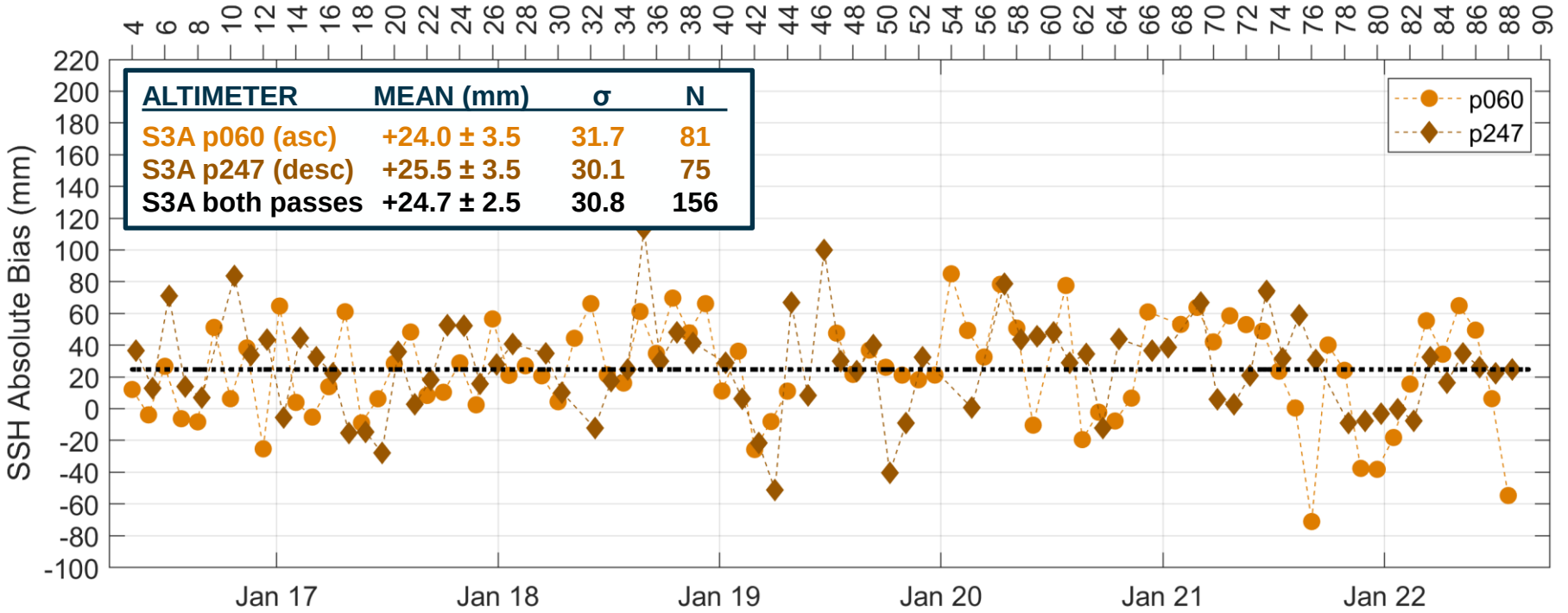


←PB04 | PB05→
(from c87)

Results: S3A PLRM Absolute Bias

- **PLRM bias increases c.f. SAR (~18 mm to ~25 mm).**
- **PLRM bias variability increases c.f. SAR (~22 mm to ~31 mm).**
- **Trend from robust linear fit is insignificant (+0.5 ± 2.7 mm/yr).**

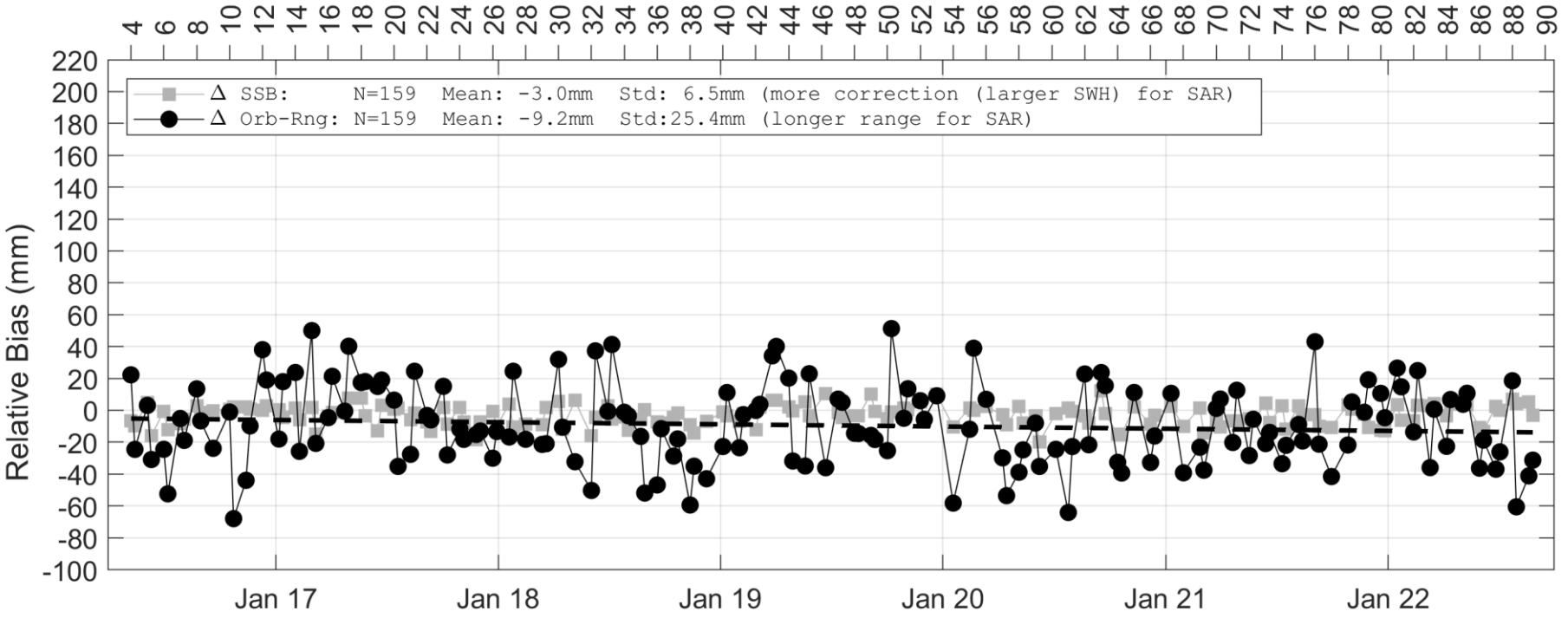




←PB04 | PB05→
(from c87)

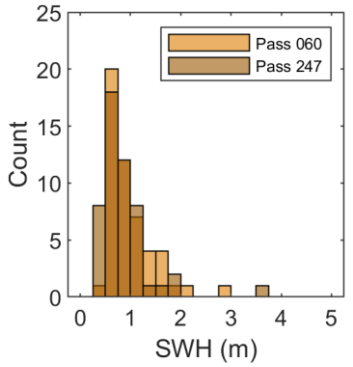
Results: S3A SAR - PLRM

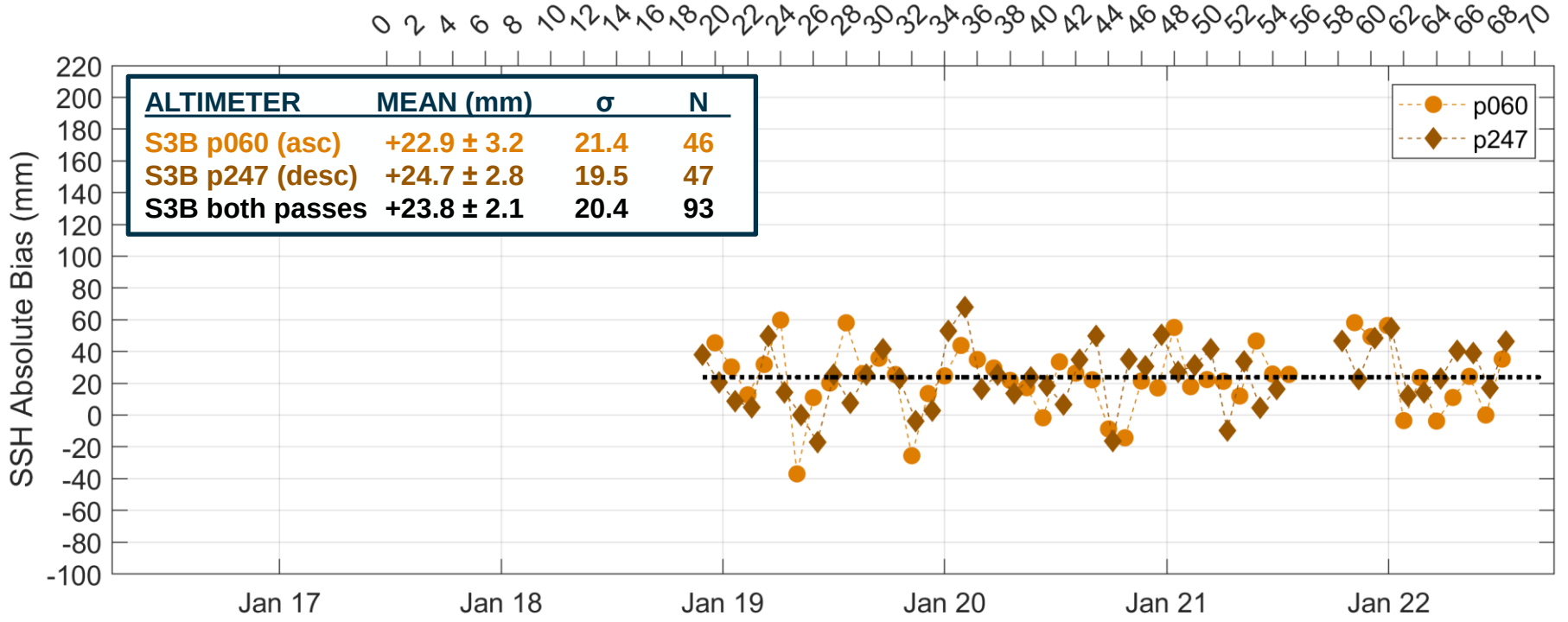
- **Relative SSH bias (SAR-PLRM): -8.4 ± 2.4 mm (SAR SSH is lower).**
- **Trend from robust linear fit to Δ(Orbit-Range) is insignificant: (-1.4 ± 2.2 mm/yr)**



Results: S3B SAR Absolute Bias

- **PB04/05. Compared here against in situ SSH at the S3B cross over.**
- **S3B absolute bias marginally higher than S3A (~24 mm vs ~18 mm). Similar variability.**
- **Trend insignificant.**

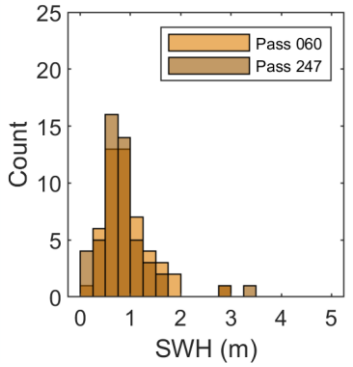


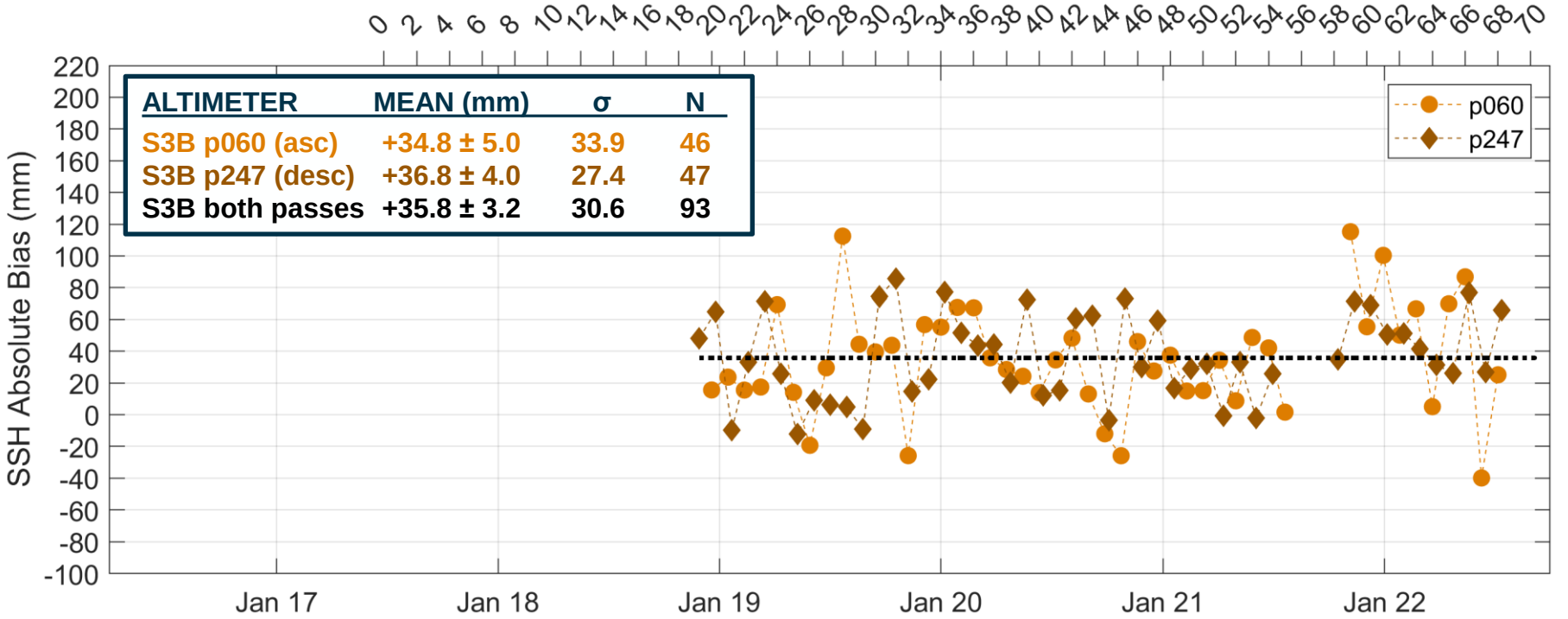


←PB04 | PB05→
(from c67)

Results: S3B PLRM Absolute Bias

- **Similar increases as per S3A.**
- **PLRM bias increases c.f. SAR (~36 mm to ~24 mm).**
- **PLRM bias variability increases c.f. SAR (~20 mm to ~31 mm).**

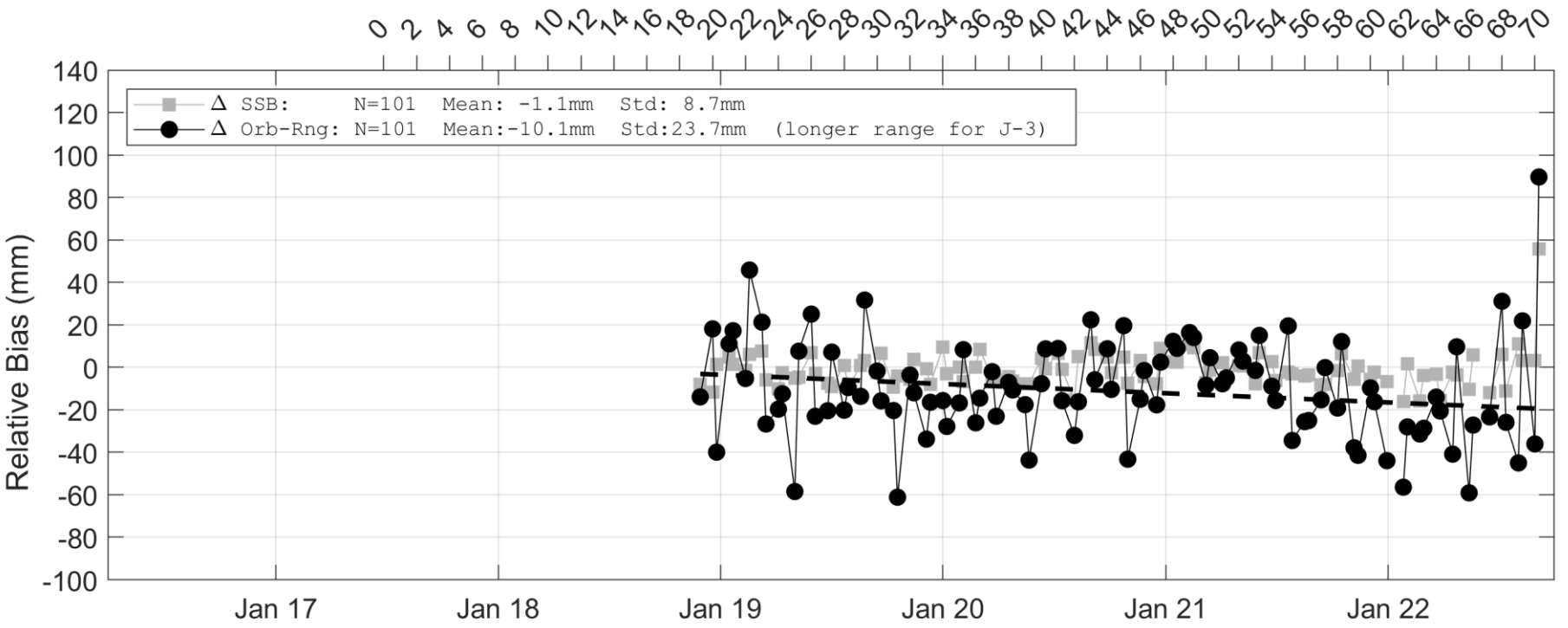




←PB04 | PB05→
(from c67)

Results: S3B SAR-PLRM Relative Bias

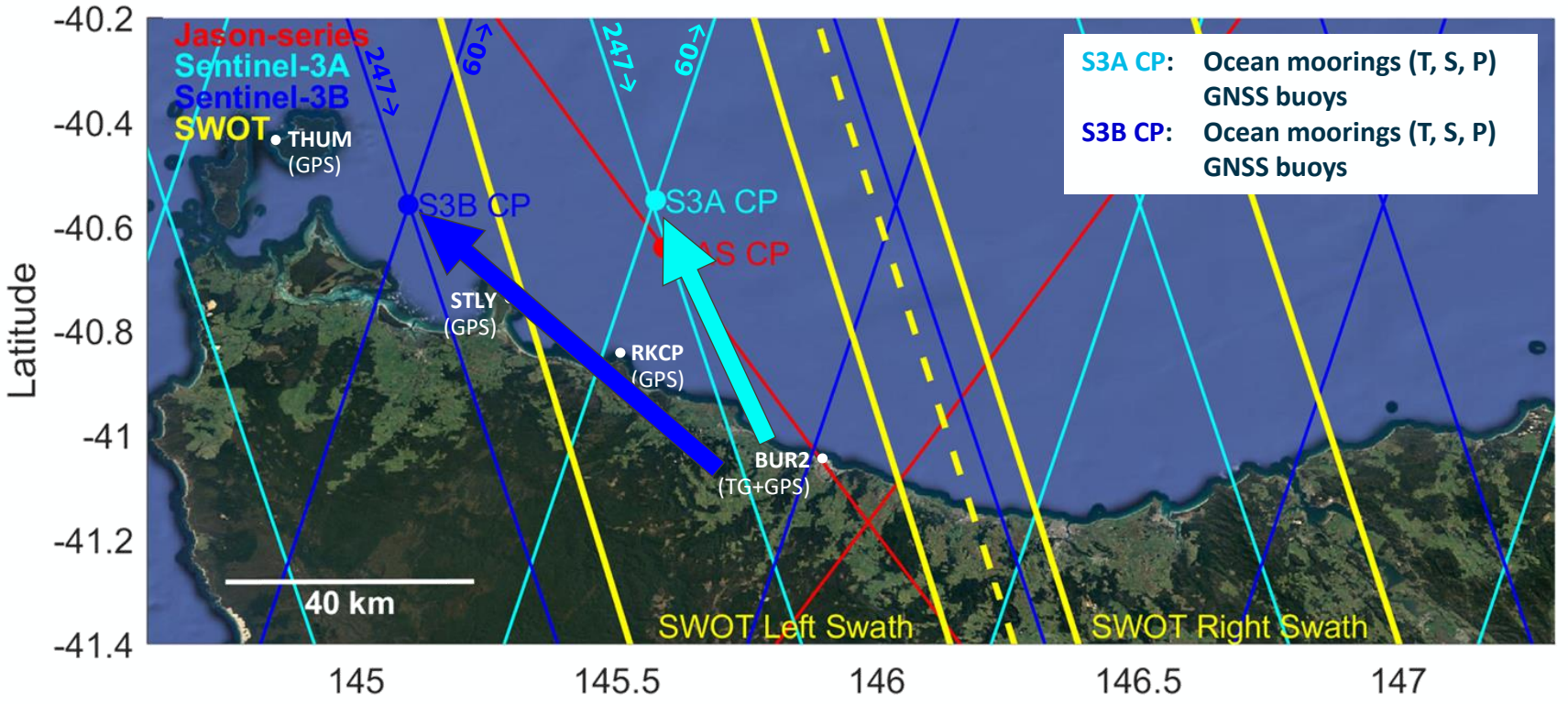
- **Relative SSH bias (SAR-PLRM): -10.1 ± 2.4 mm (SAR SSH is lower).**
- **Marginally more structure and trend apparent in the Δ(Orbit-Range) time series. Trend remains insignificant:**
  - **OLS: -2.2 ± 4.3 mm/yr**
  - **Robust: -4.3 ± 4.0 mm/yr.**



←PB04 | PB05→
(from c67)

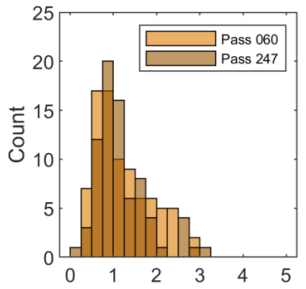
Comparison: Bias estimates using the coastal tide gauge

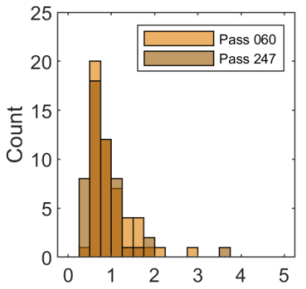
- **Purely for comparison and as a sanity check, absolute biases computed at the comparison points using the coastal tide gauge agree to within ~1-4 mm of those computed against the offshore moorings and GNSS buoys (expected).**
- **Variability increases as expected, especially for S3B given separation from tide gauge. (~5-6 mm increase in std dev for S3A, ~15 mm for S3B).**

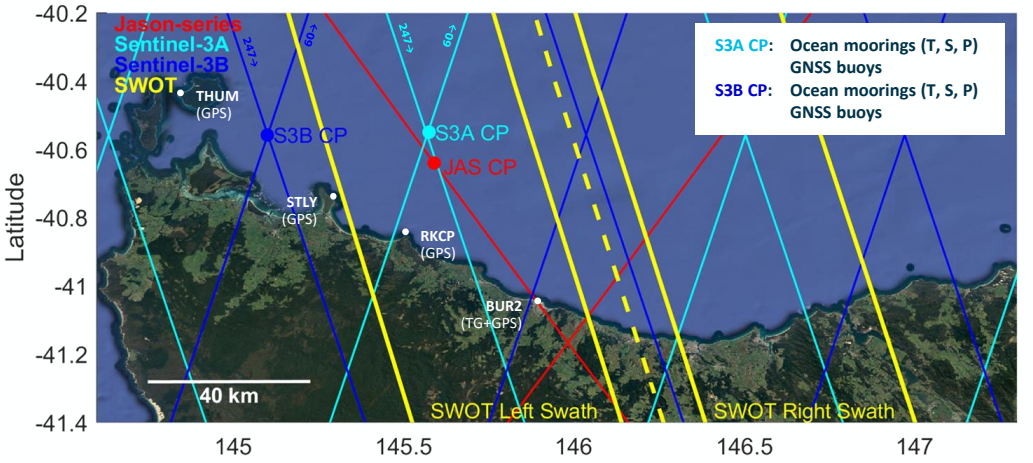


Summary

- **S3A and S3B SAR absolute biases at the Bass Strait facility are at the ~20 mm level, slightly higher for S3B (18 v 24 mm).**
- **Variability of the SAR absolute bias time series is also at the ~20 mm level underscoring the performance of each mission and the Bass Strait in situ time series.**
- **Absolute bias and variability for both missions increase by approximately ~10 mm when using PLRM in place of SAR.**
- **Non-averaging errors likely limit absolute bias uncertainty to ~10 mm.**







Mission	Cycles	Absolute Bias	Std Dev (Sample Size)
S3A SAR (PB04/05)	3 -> 88	+18 mm *+18 mm*	22 mm (n = 158) *28 mm (vs Coastal TG)*
S3A PLRM (PB04/05)	3 -> 88	+25 mm *+26 mm*	31 mm *36 mm (vs Coastal TG)*
S3B SAR (PB04/05)	19 -> 69	+24 mm *+20 mm*	20 mm (n = 93) *35 mm (vs Coastal TG)*
S3B PLRM (PB04/05)	19 -> 69	+36 mm *+37 mm*	31 mm *41 mm (vs Coastal TG)*
Jason-3 GDRF	1 -> 208	-3.2 mm	24 mm (n = 191)
Sentinel-6 MF HR	4 -> 68	-3.1 mm	23 mm (n = 53)

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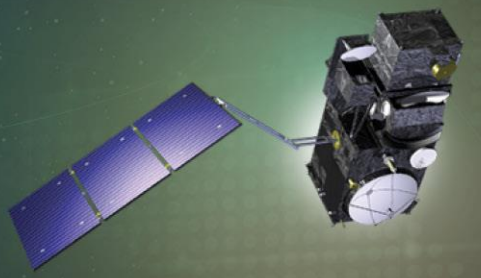

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Questions?

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15 YEARS of IMOS

IMOS Integrated Marine Observing System

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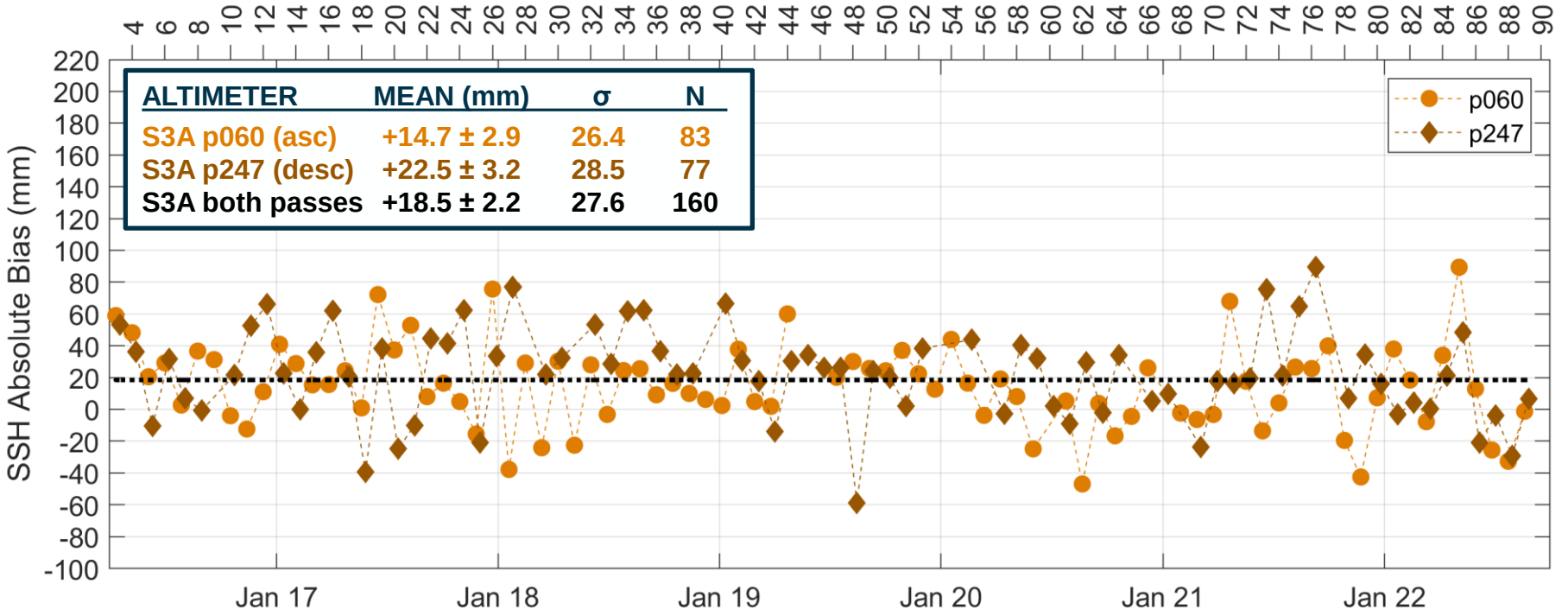
1. Geography, Planning, and Spatial Sciences, University of Tasmania.
2. Integrated Marine Observing System
3. CSIRO Oceans and Atmosphere, Hobart, Australia.

Spares

Results: S3A SAR (v tide gauge)

Computed against tide gauge: expect higher variability than against mooring.

- **PB04/05. Compared here against tidally and dAP corrected TG.**

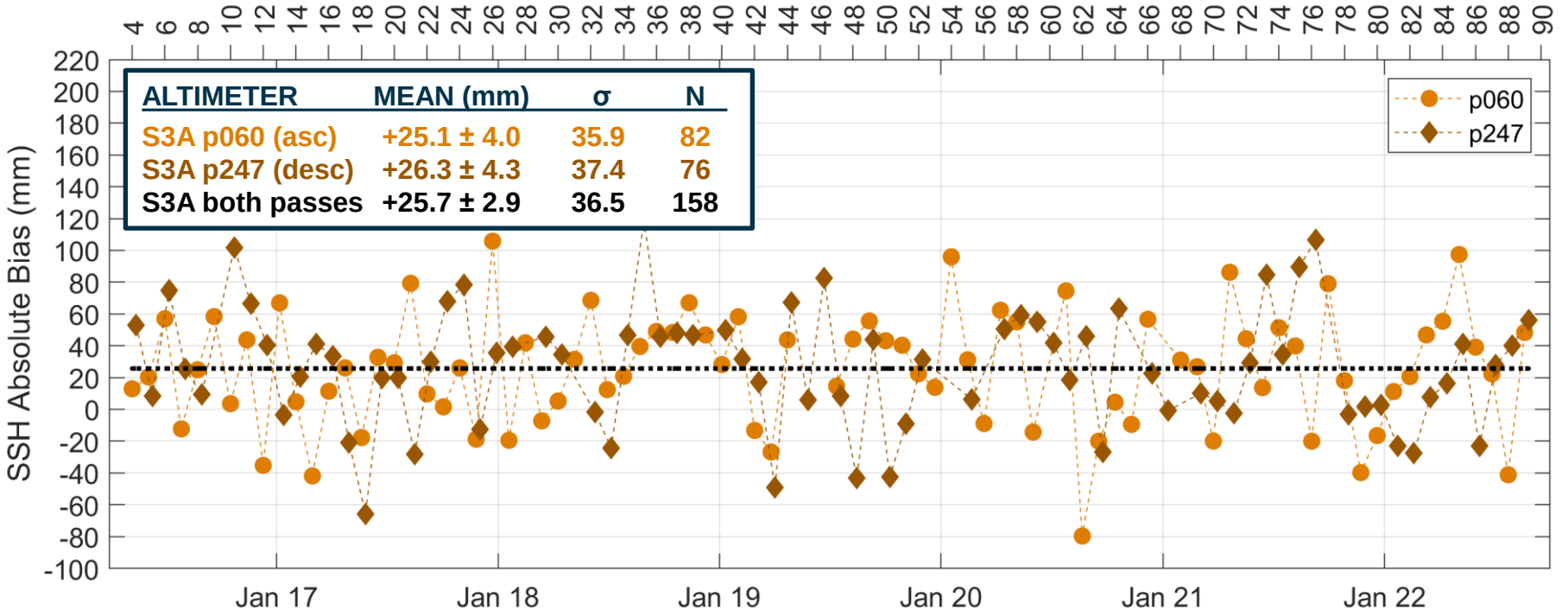


←PB04 | PB05→
(from c87)

Results: S3A PLRM (v tide gauge)

Computed against tide gauge: expect higher variability than against mooring.

- **PB04/05. Compared here against tidally and dAP corrected TG.**

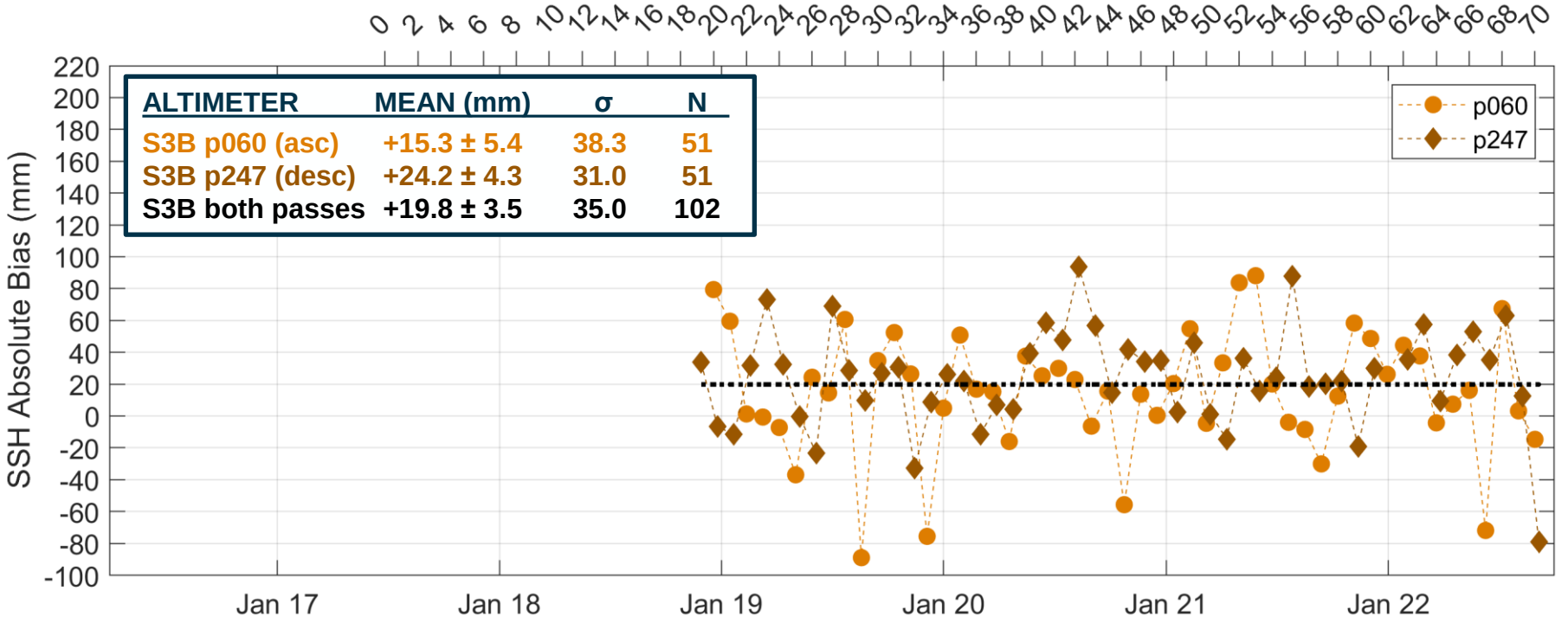


←PB04 | PB05→
(from c87)

Results: S3B SAR (v tide gauge)

Computed against tide gauge: expect higher variability than against mooring.

- **PB04/05. Compared here against tidally and dAP corrected TG.**



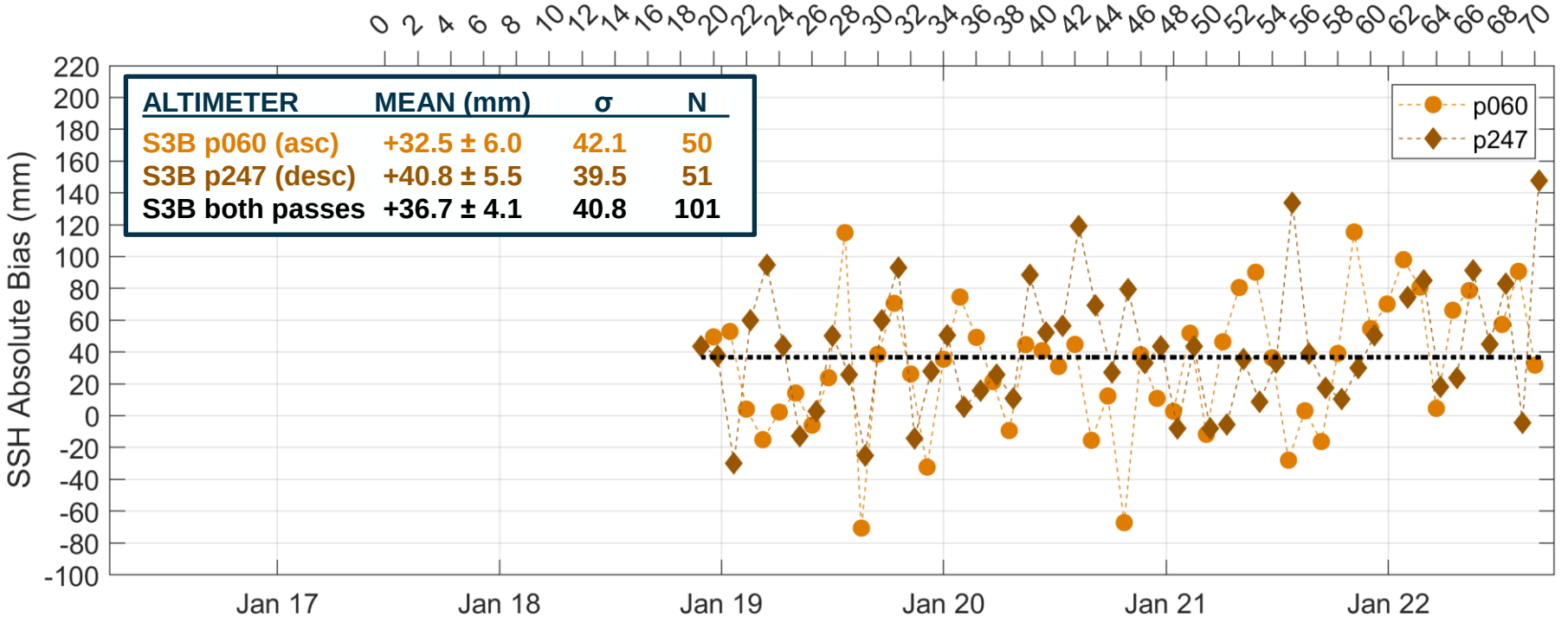
ALTIMETER	MEAN (mm)	σ	N
S3B p060 (asc)	+15.3 ± 5.4	38.3	51
S3B p247 (desc)	+24.2 ± 4.3	31.0	51
S3B both passes	+19.8 ± 3.5	35.0	102

←PB04 | PB05→
(from c67)

Results: S3B PLRM (v tide gauge)

Computed against tide gauge: expect higher variability than against mooring.

- **PB04/05. Compared here against tidally and dAP corrected TG.**



←PB04 | PB05→
(from c67)

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Original = S3A_SR_2_WAT___019_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
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Original = S3A_SR_2_WAT___020_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___020_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___021_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___021_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___022_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___022_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___023_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___023_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___024_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___024_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___025_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___025_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___026_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___026_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___027_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___027_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___028_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___028_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___029_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___029_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___030_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___030_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___031_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___031_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___032_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___032_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___033_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___033_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___034_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___034_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___035_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___035_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___036_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___036_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___037_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___037_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___038_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___038_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___039_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___039_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___040_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___040_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___041_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___041_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___042_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___042_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___043_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___043_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___044_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___044_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___045_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___045_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___046_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___046_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___047_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___047_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___048_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___048_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___049_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___049_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___050_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___050_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___051_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___051_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___052_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___052_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___053_060_____MAR_O_NT_003.nc (IPF-SM-2 06.15)
Original = S3A_SR_2_WAT___053_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___054_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___054_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___055_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___055_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___056_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___056_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___057_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___057_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___058_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___058_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___059_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___059_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3A_SR_2_WAT___060_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___060_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___061_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___061_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___062_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___062_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___063_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___063_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___064_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___064_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___065_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___065_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___066_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___066_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___067_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___067_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___068_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___068_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___069_060_____MAR_O_ST_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___069_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___070_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___070_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___071_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___071_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___072_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___072_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___073_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___073_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___074_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___074_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___075_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___075_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___076_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___076_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___077_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___077_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___078_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___078_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3A_SR_2_WAT___079_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___079_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___080_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___080_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___081_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___081_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___082_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___082_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___083_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___083_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___084_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___084_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___085_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___085_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___086_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___086_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3A_SR_2_WAT___087_060_____MAR_O_NT_005.nc (IPF-SM-2 07.01)
Original = S3A_SR_2_WAT___087_247_____MAR_O_NT_005.nc (IPF-SM-2 07.01)
Original = S3A_SR_2_WAT___088_060_____MAR_O_NT_005.nc (IPF-SM-2 07.02)
Original = S3A_SR_2_WAT___088_247_____MAR_O_NT_005.nc (IPF-SM-2 07.02)
Original = S3A_SR_2_WAT___089_060_____MAR_O_NT_005.nc (IPF-SM-2 07.02)
Original = S3A_SR_2_WAT___089_247_____MAR_O_NT_005.nc (IPF-SM-2 07.02)
Original = S3A_SR_2_WAT___090_060_____MAR_O_ST_005.nc (IPF-SM-2 07.02)
Original = S3A_SR_2_WAT___090_247_____MAR_O_ST_005.nc (IPF-SM-2 07.02)

S3A RADS

Original = S3B_SR_2_WAT___019_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___020_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___020_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___021_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___021_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___022_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___022_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___023_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___023_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___024_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___024_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___025_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___025_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___026_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___026_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___027_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___027_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___028_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___028_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___029_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___029_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___030_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___030_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___031_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___031_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___032_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___032_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___033_060_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___033_247_____MR1_R_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___034_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___034_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___035_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___035_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___036_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___036_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___037_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___037_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___038_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___038_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___039_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___039_247_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___040_060_____MAR_O_NT_004.nc (IPF-SM-2 06.18)
Original = S3B_SR_2_WAT___040_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___041_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___041_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___042_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___042_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___043_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___043_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___044_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___044_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___045_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___045_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___046_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___046_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___047_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___047_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___048_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___048_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___049_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___049_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___050_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___050_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___051_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___051_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___052_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___052_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___053_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___053_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___054_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___054_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___055_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___055_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___056_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___056_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___057_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___057_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___058_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___058_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___059_060_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___059_247_____MAR_O_NT_004.nc (IPF-SM-2 06.50)
Original = S3B_SR_2_WAT___060_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___060_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___061_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___061_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___062_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___062_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___063_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___063_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___064_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___064_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___065_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___065_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___066_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___066_247_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___067_060_____MAR_O_NT_004.nc (IPF-SM-2 06.52)
Original = S3B_SR_2_WAT___067_247_____MAR_O_NT_005.nc (IPF-SM-2 07.01)
Original = S3B_SR_2_WAT___068_060_____MAR_O_NT_005.nc (IPF-SM-2 07.01)
Original = S3B_SR_2_WAT___068_247_____MAR_O_NT_005.nc (IPF-SM-2 07.01)
Original = S3B_SR_2_WAT___069_060_____MAR_O_NT_005.nc (IPF-SM-2 07.02)
Original = S3B_SR_2_WAT___069_247_____MAR_O_NT_005.nc (IPF-SM-2 07.02)
Original = S3B_SR_2_WAT___070_060_____MAR_O_NT_005.nc (IPF-SM-2 07.02)
Original = S3B_SR_2_WAT___070_247_____MAR_O_NT_005.nc (IPF-SM-2 07.02)
Original = S3B_SR_2_WAT___071_060_____MAR_O_ST_005.nc (IPF-SM-2 07.02)
Original = S3B_SR_2_WAT___071_247_____MAR_O_ST_005.nc (IPF-SM-2 07.02)

S3B RADS