The SWOT long-wavelength CalVal using the on-board Nadir altimeter

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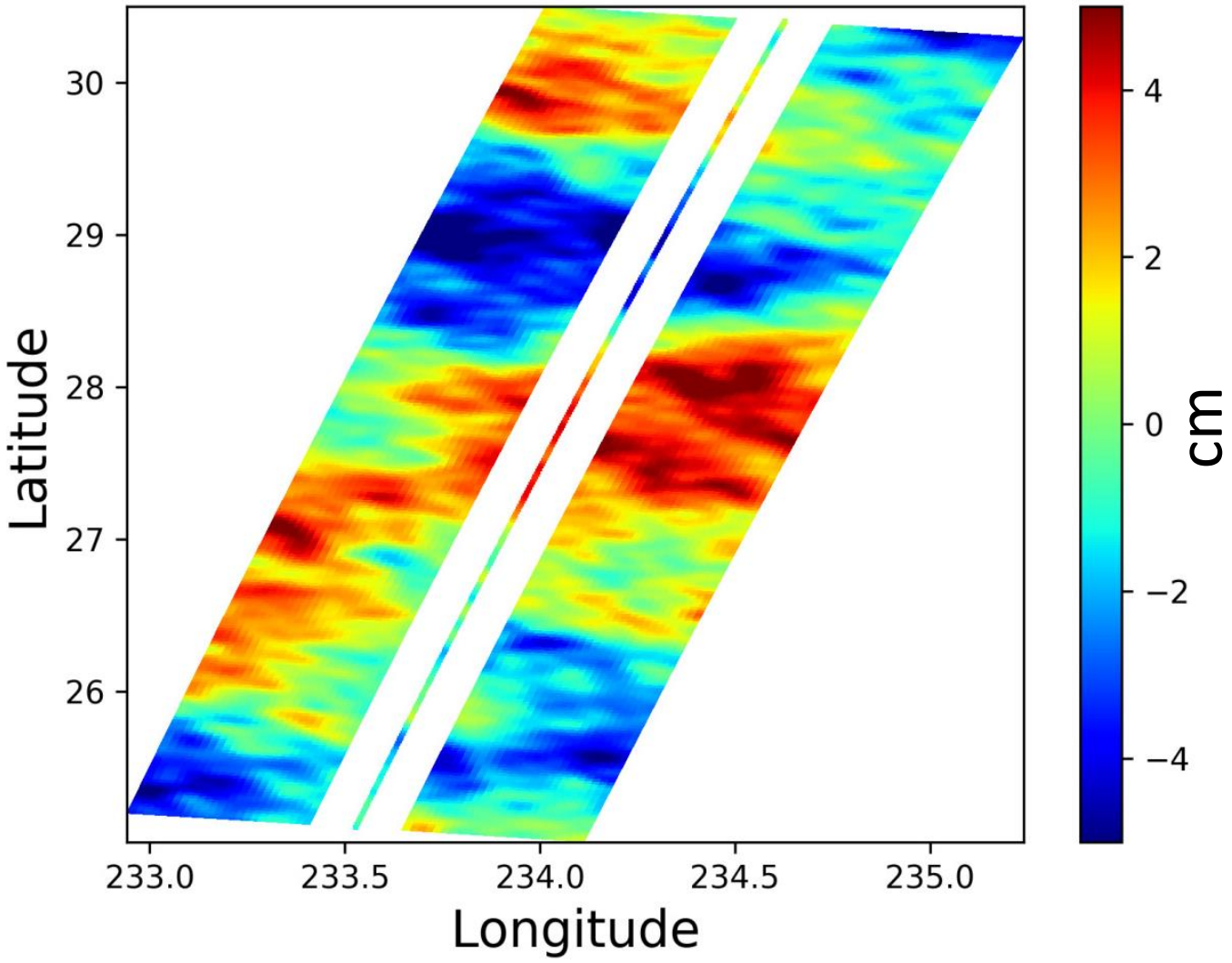
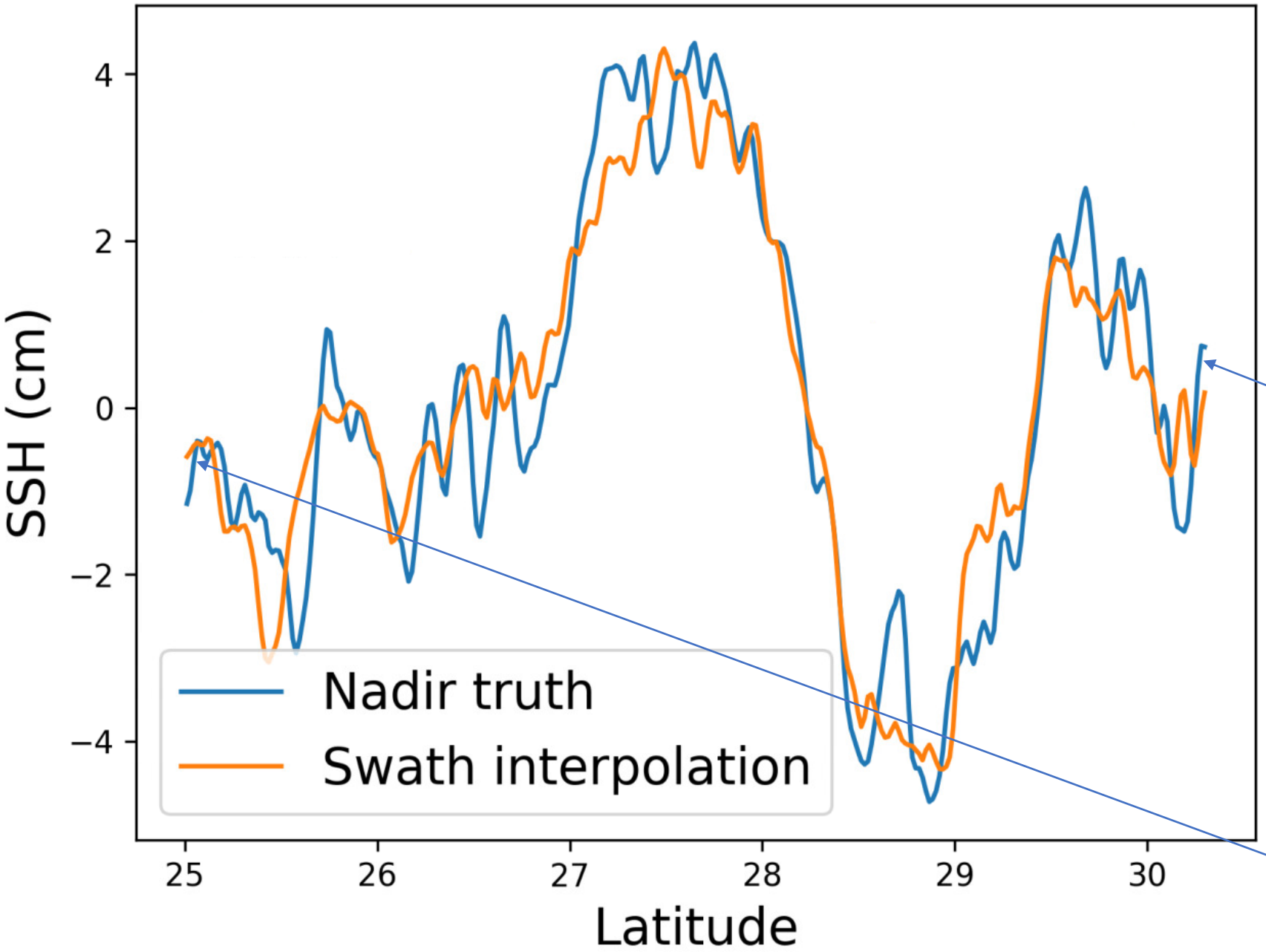
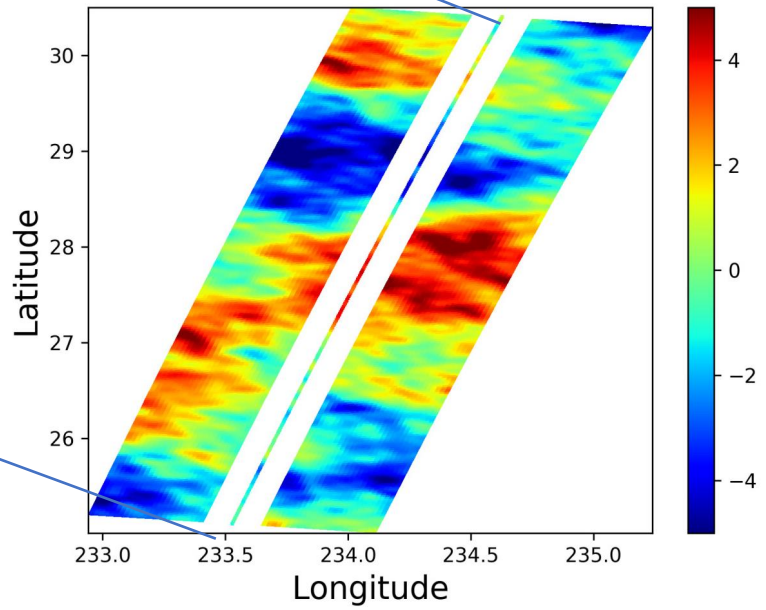
Long-wavelength CalVal

- In-situ CalVal: 15km – ? (100 or 150 km?)
- Long-wavelength CalVal relies on the on-board Nadir altimeter.
- The Jason-class Nadir altimeter resolves >∼70km wavelength,
- but the KaRIn measurements are off Nadir leading to representation errors.
- At what wavelength can we rely on the Nadir altimeter for long-wavelength CalVal?



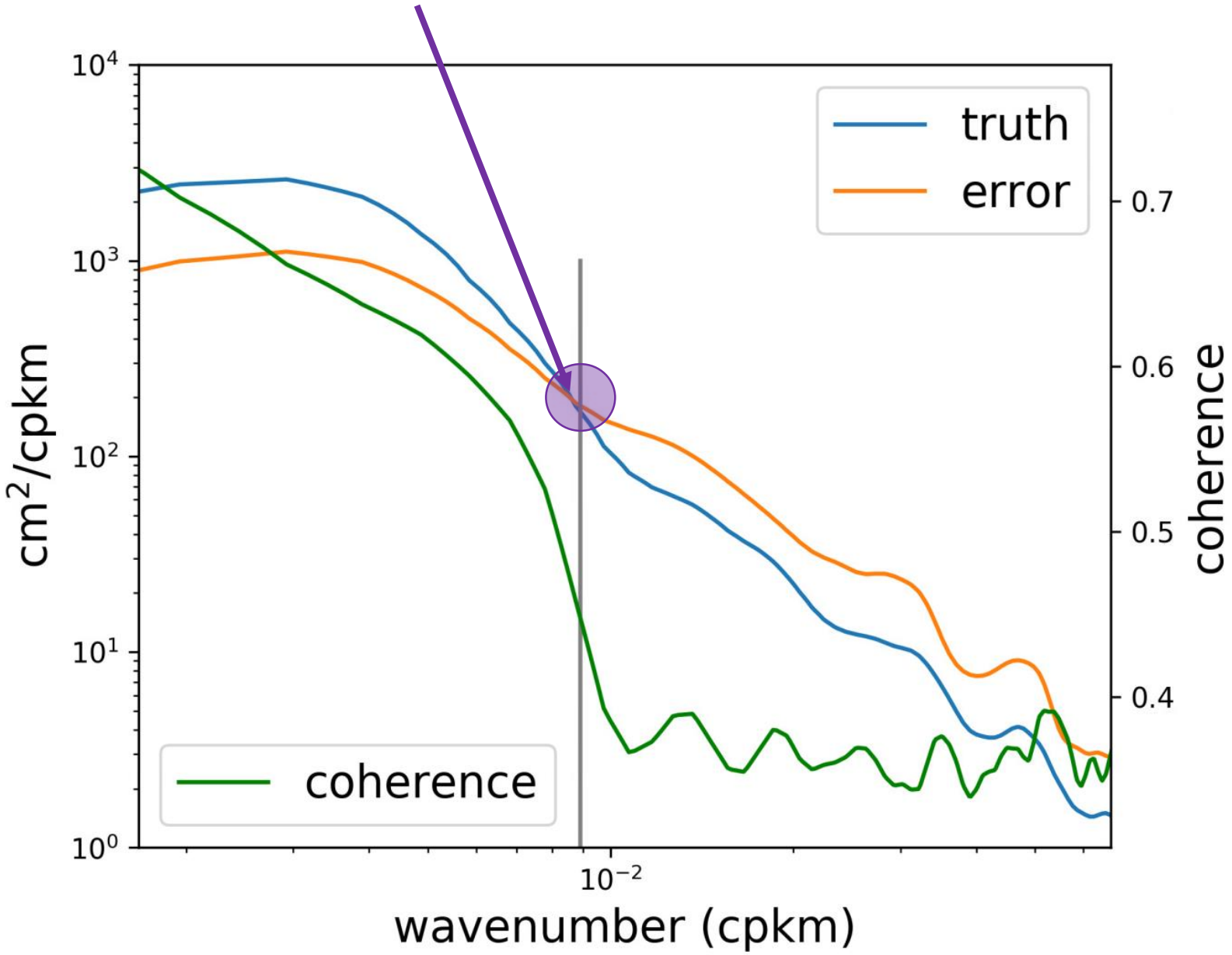
The error: the difference between the truth and and the swath-interpolation.

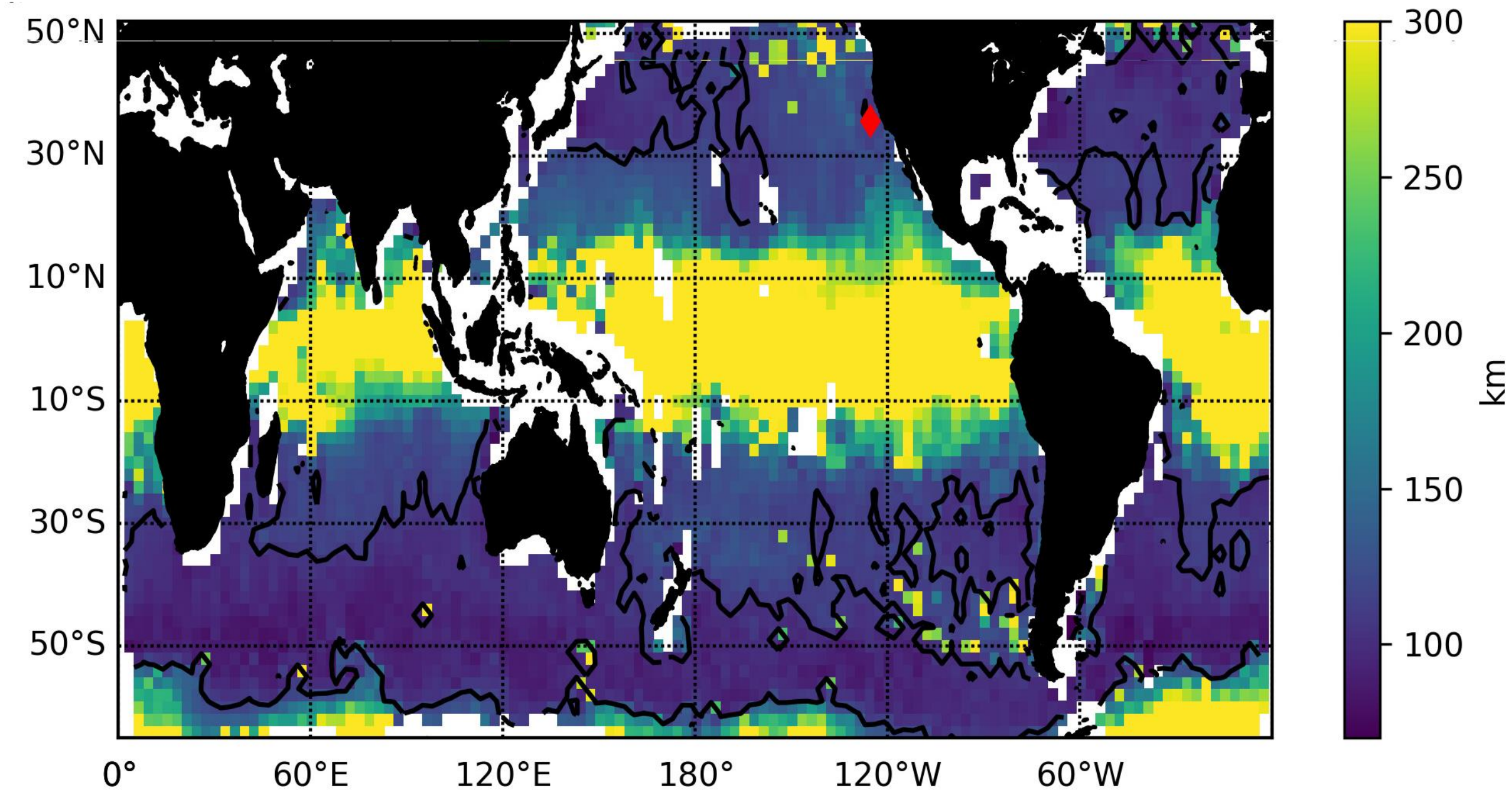




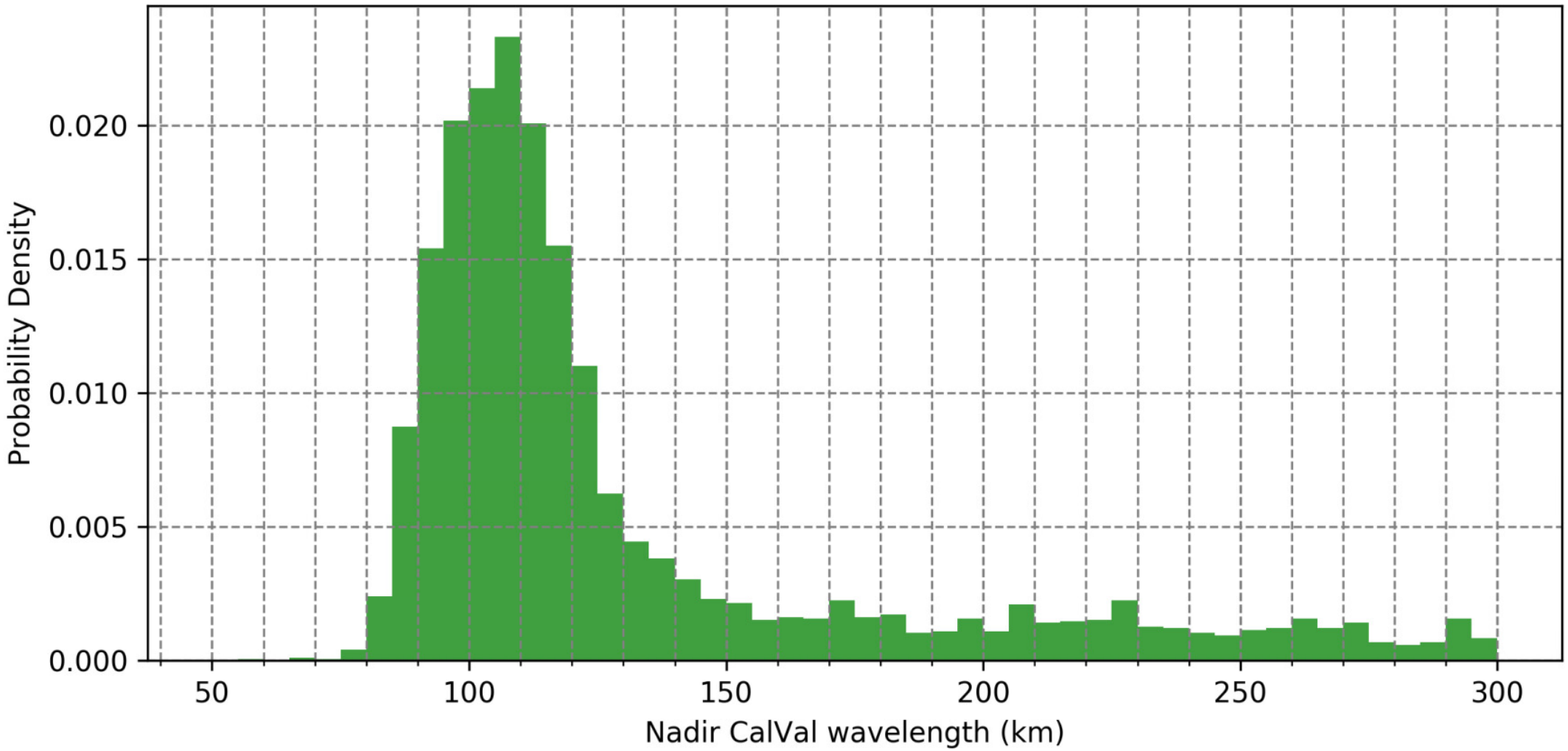
1. The MITgcm 1/48th simulation
2. The daily snapshots are interpolated onto the SWOT swath along the science orbit.
3. No SWOT errors are considered.
4. Nadir-scale: the wavelength below which the signal-to-error ratio is below 1.

Nadir-scale




50°N
30°N
10°N
10°S
30°S
50°S
0°
60°E
120°E
180°
120°W
60°W
300
250
200
150
100
km

The PDF of the Nadir-Scale over the global ocean. Values below 50km or above 300 km are excluded.



Conclusions

1. The highest probability lies at about 110 km.
2. 150 km at the cross-over point in the California Current.