

The ASCAT tandem operation scenario and its implications on soil moisture retrievals

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Overview

Needs to be done

ASCAT tandem operation

- ASCAT tandem phase initiated with launch of ASCAT-B in Sept. 2012
- ASCAT-A and B in same sun-synchronous orbit
 - phasing ~ 48 min. (half an orbit)
- Phasing suboptimal for ASCAT sensor geometry
 - ASCAT-A right interleave ASCAT-B left swath
 - min. revisit times at equator ~ 48 min.

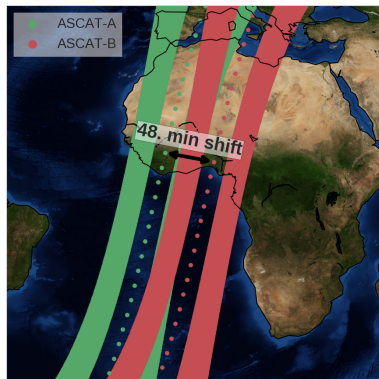
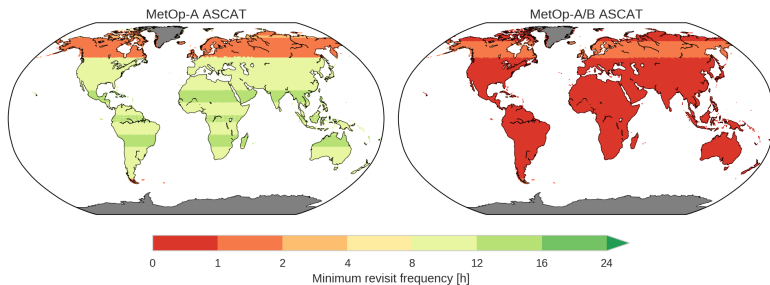
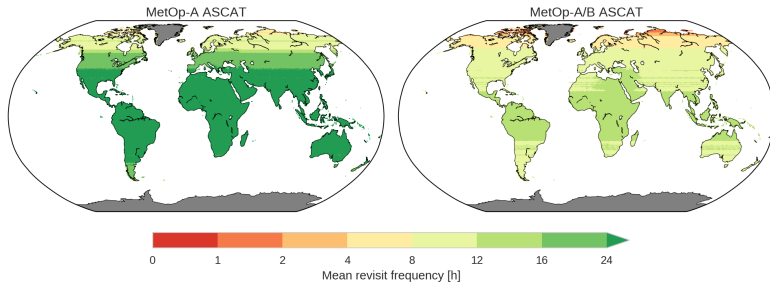


Figure 1 : Orbit Phasing ASCAT-A and ASCAT-B

Revisit time statistics

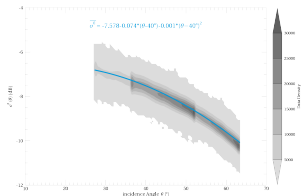


Soil Moisture Retrieval

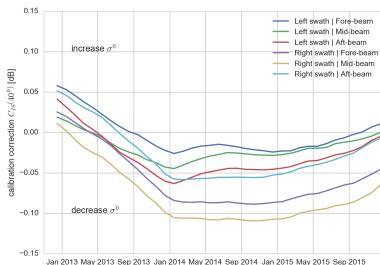
Flowchart of current approach Flowchart of (near) future approach * optimal solution to use both sensors * what are the consequences for mp estimation

ASCAT-B Level 1b calibration status

- Inter-calibration with respect to ASCAT-A

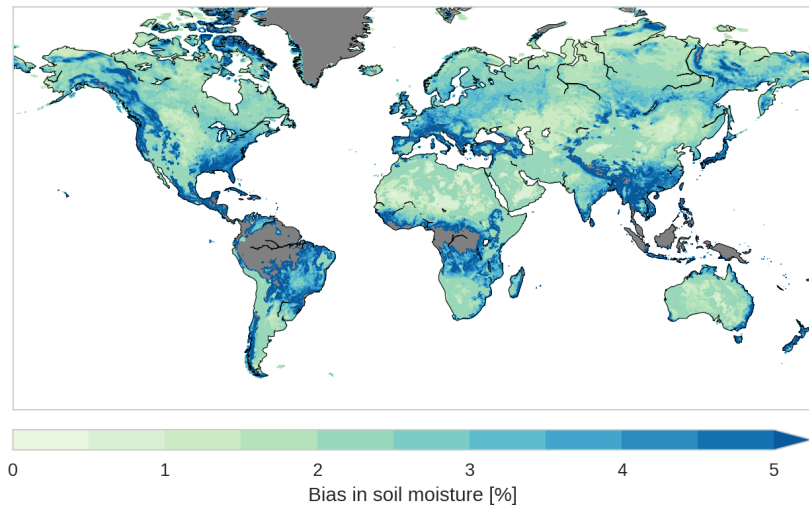


- Long-term trend estimated over different cal. targets
 - Amazon, Congo and Indonesia Rainforest



Calibration induced SM bias

Level 1 calibration bias of 0.1 dB between ASCAT-A and ASCAT-B



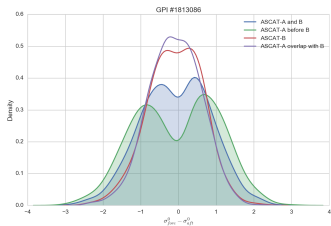
Soil moisture model parameter estimation

- TU-Wien soil moisture model

- physically motivated,
semi-empirical change
detection
- model parameters

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ESD - Backscatter Noise

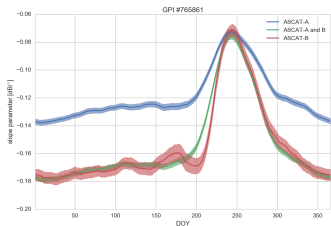


Azimuth Correction



Periodic parameter

Slope



Local Slopes

Image of local slope estimation

Validation with respect to in-situ soil moisture

- Validation of three ASCAT SSM products

- 1 ASCAT- A

- 2 ASCAT-B

- 3 ASCAT-A and ASCAT-B

- ISMN in-situ data

- 23 networks with xx stations in total

- sensor depth

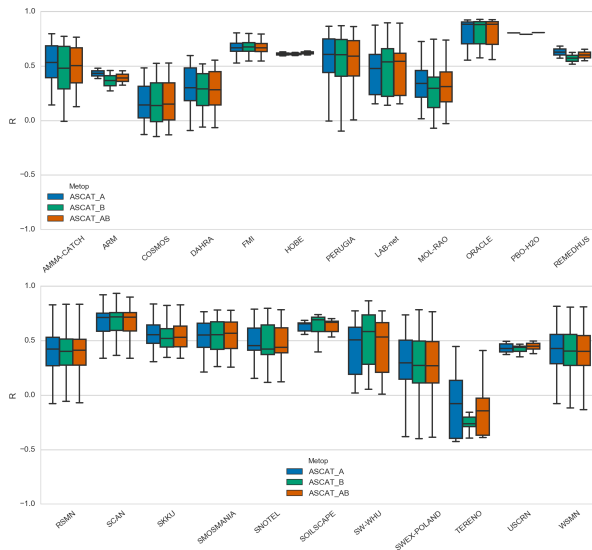
- Validation settings

- scaling

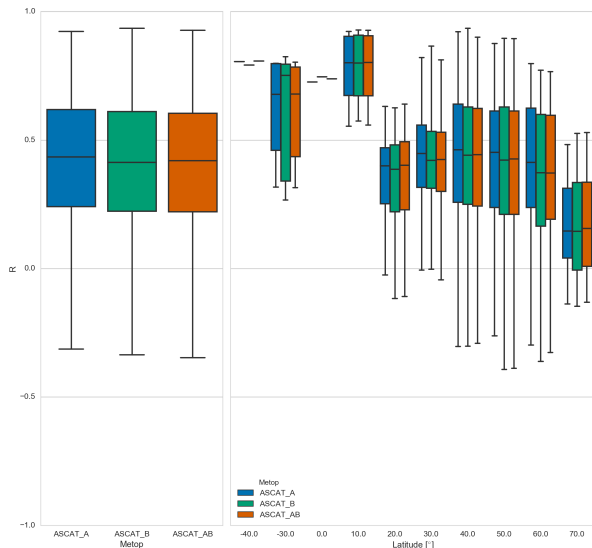
- temporal matching

-

In-situ validation results per network



In-situ validation results global summary



Soil Moisture Validation ERA-interim

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Conclusion