IPGP-IGN/JPL AC AWG IDS meeting 2025 SWOT first results

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Outline

- SWOT – Data difficulties (cddis)
- First results
  - Solar Scale
  - Orbits
  - Observation WRMS
- Conclusion

SWOT – Data Difficulties

Solar panel quaternions :

- daily file : cddis issue

Issue 1 : Multiple files for the same day

Exemple :

swoqsolp20240412235923_20240413235923.001.xml

From the name : data from **2024-04-12 23:59:23** to **2024-04-13 23:59:23**

swoqsolp20240413090002_20240413235959.001.xml

From the name : data from **2024-04-13 09:00:02** to **2024-04-13 23:59:59**

Issue 2 : Lack of data in file / Not a date compatible with the name of the file

Exemple :

swoqsolp20240413090002_20240413235959.001.xml

From the name : data from **2024-04-13 09:00:02** to **2024-04-13 23:59:59**

In this file, no data after 2024-04-13 04h ...

Issue 3 : File without data

Exemple : **swoqsolp20240909235923_20240910235923.001.xml**

SWOT – Data Difficulties

Conclusion :

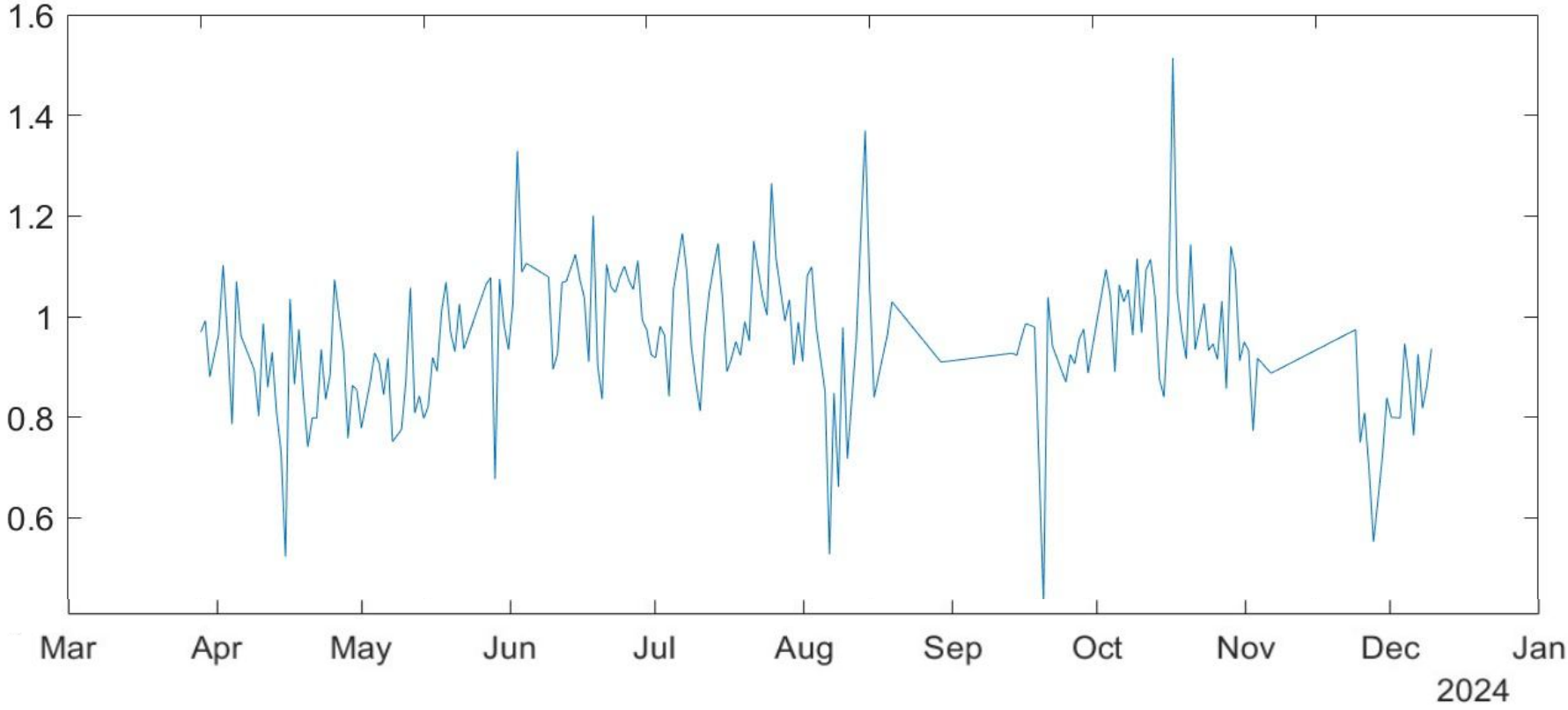
No solar panel quaternion before 2024-03-20 on cddis
Between 2024-03-20 and 2025-01-01 : 346 files for 285 days !

On GipsyX : 228 days processed / 182 days providing good orbits and RMS

PS : Need to add/remove 0.2 deg to the quaternion value …. Not user friendly

Solar Scale values

Only values between 0.4 and 1.6 shown.
Median value : **0.95**



First results - orbits

- Over the 228 days :

  - 148d with radial RMS differences between GipsyX orbits and SSALTO < 1 cm

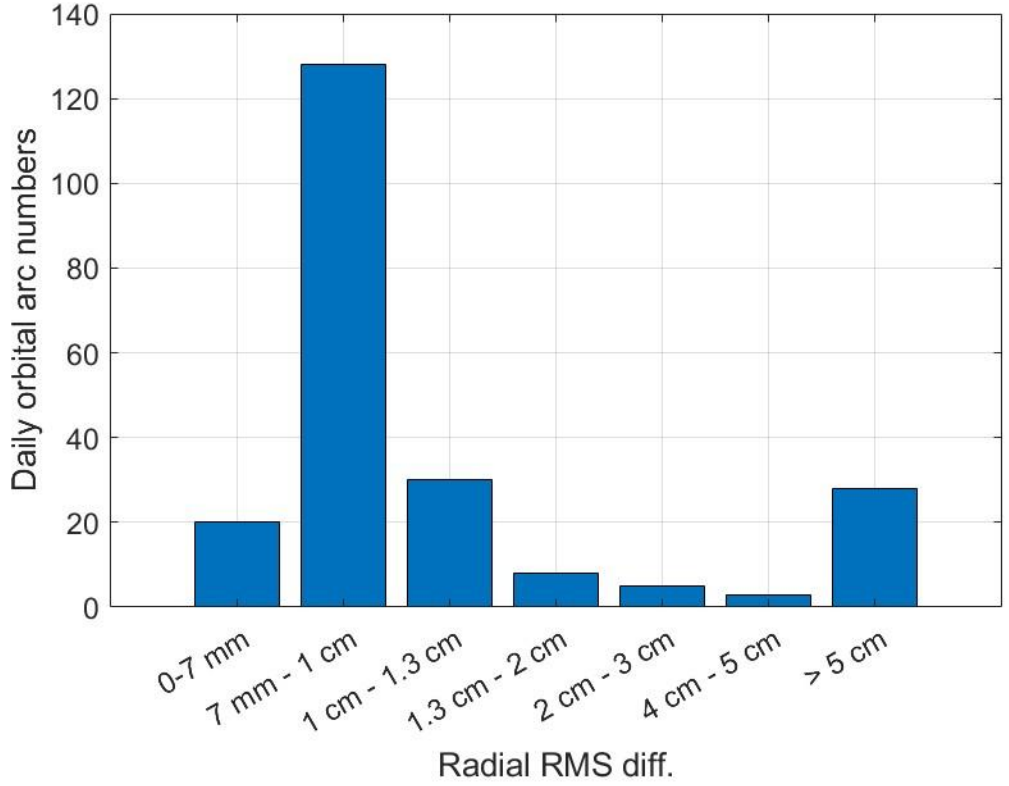
  - 28d between 1 cm and 1.2 cm

  - 6d between 1.2 cm and 1.5 cm

  - 4d between 1.5 cm and 2.0 cm

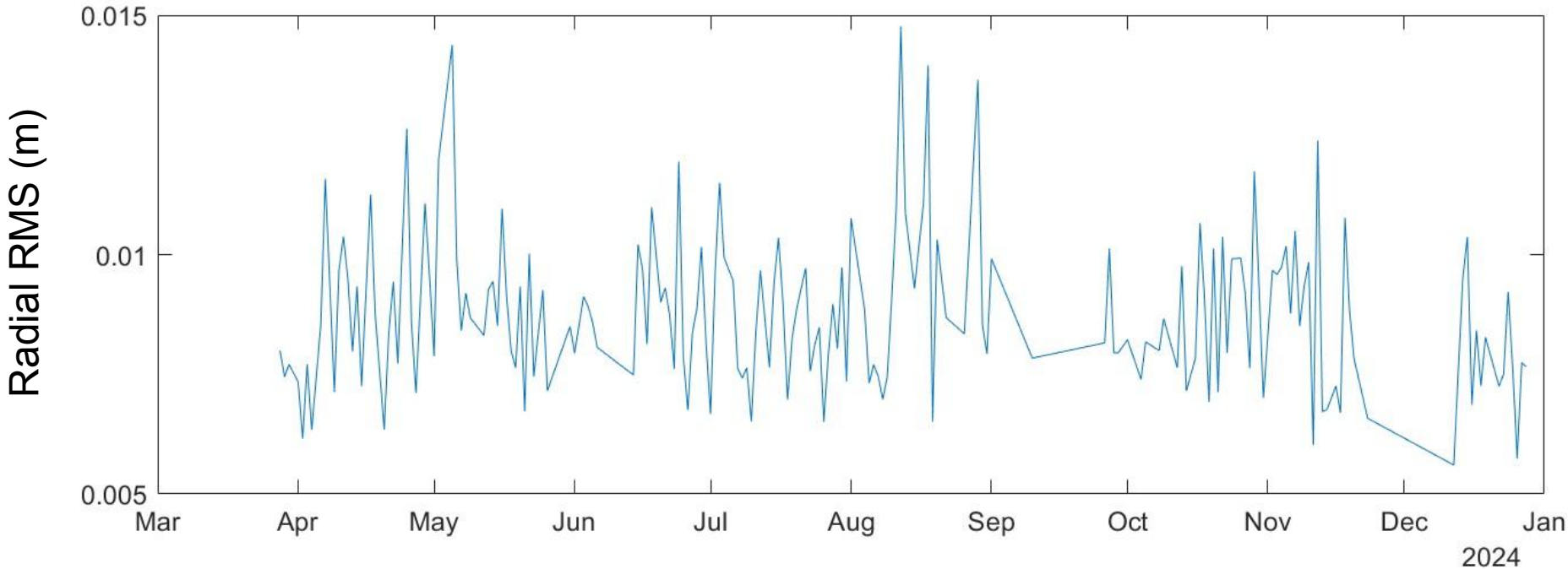
First results - orbits

Radial RMS differences between GipsyX and SSALTO

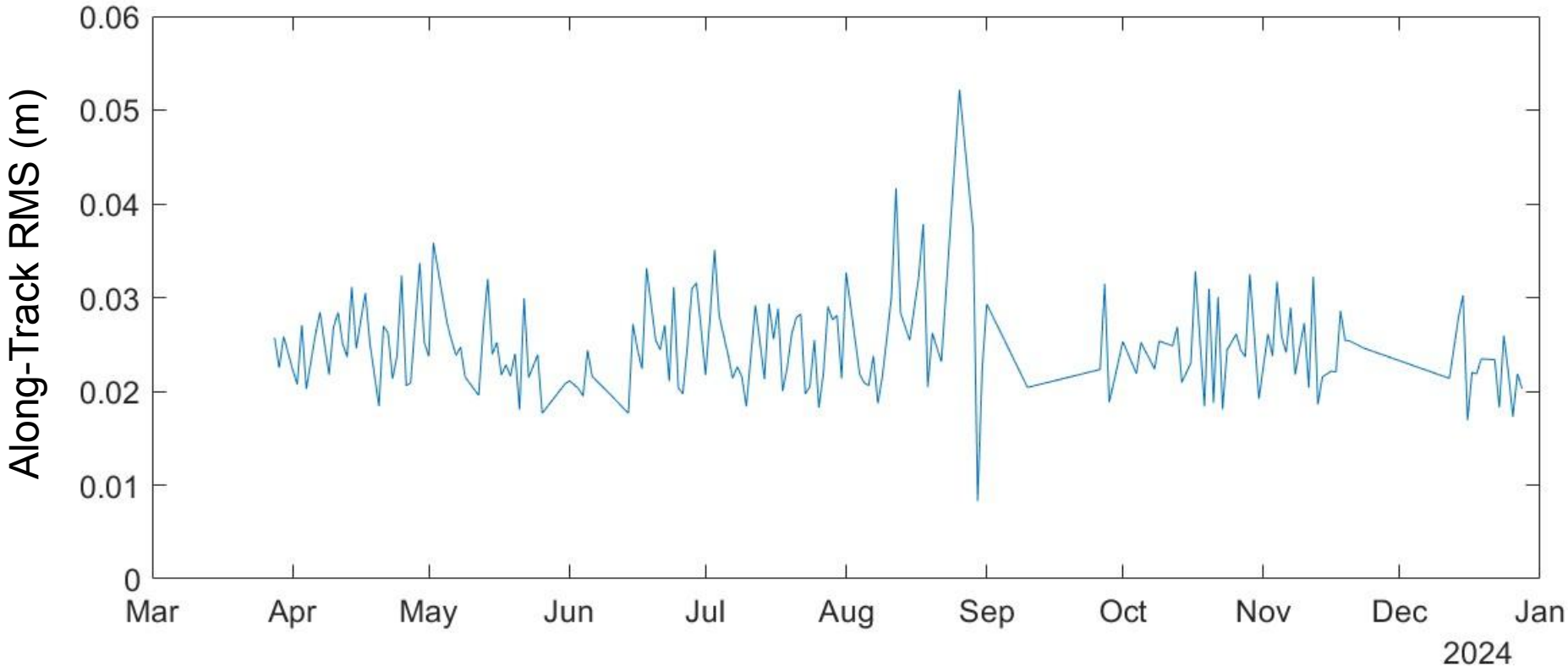


GipsyX vs SSALTO

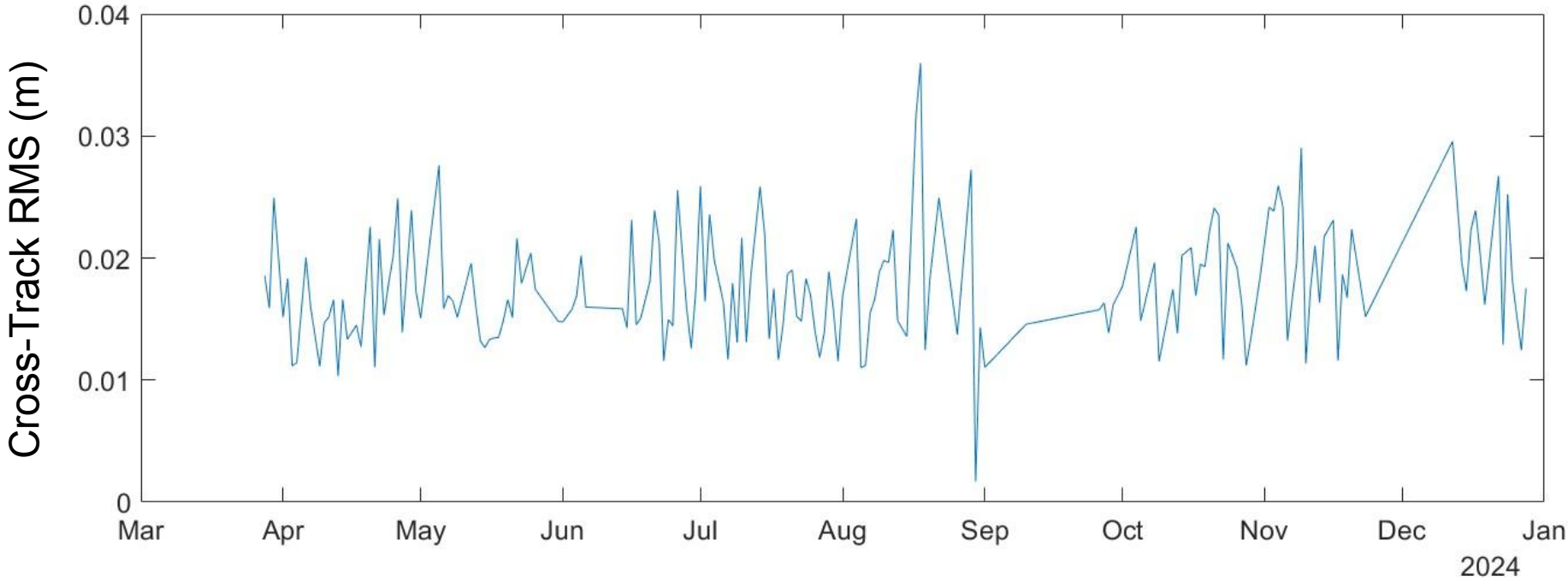
- Median of differences between GipsyX orbits and SSALTO for radial RMS diff < 1.5 cm :
  - Radial : 8.5 mm
  - Along-track : 2.4 cm
  - Cross-track : 1.7 cm



GipsyX vs SSALTO



GipsyX vs SSALTO



Observations WRMS

	Daily Obs. WRMS (mm/s)			Daily obs . Used (number and % of all observations)		
	Median	Min	Max	Median	Min	Max
Good (182d)	0.3877	0.3799	0.3985	17519 93.1 %	14681 92.1 %	18999 94.1 %
All (228d)	0.3886	0.3799	0.7824	17384 92.9 %	1223 7.6 %	18999 94.1 %

Conclusion

- Encouraging preliminary results
- Still work to fully process the SWOT measurement (cleaning of quaternions solar panel files needed, improve the orbit parameters during high solar activities – currently 1 drag parameter / hour for index K10.7_Fp > 120, else 1 per 8 hour).
- Study of the few « bad » days without apparent quaternion issue
- Next step :
  Add SWO in the weekly multi-satellite solution (hope to provide one multi-sat. Solution with and one without SWOT for the next AC submission to IDS)