

Validation of IMERG for Oceanic Areas



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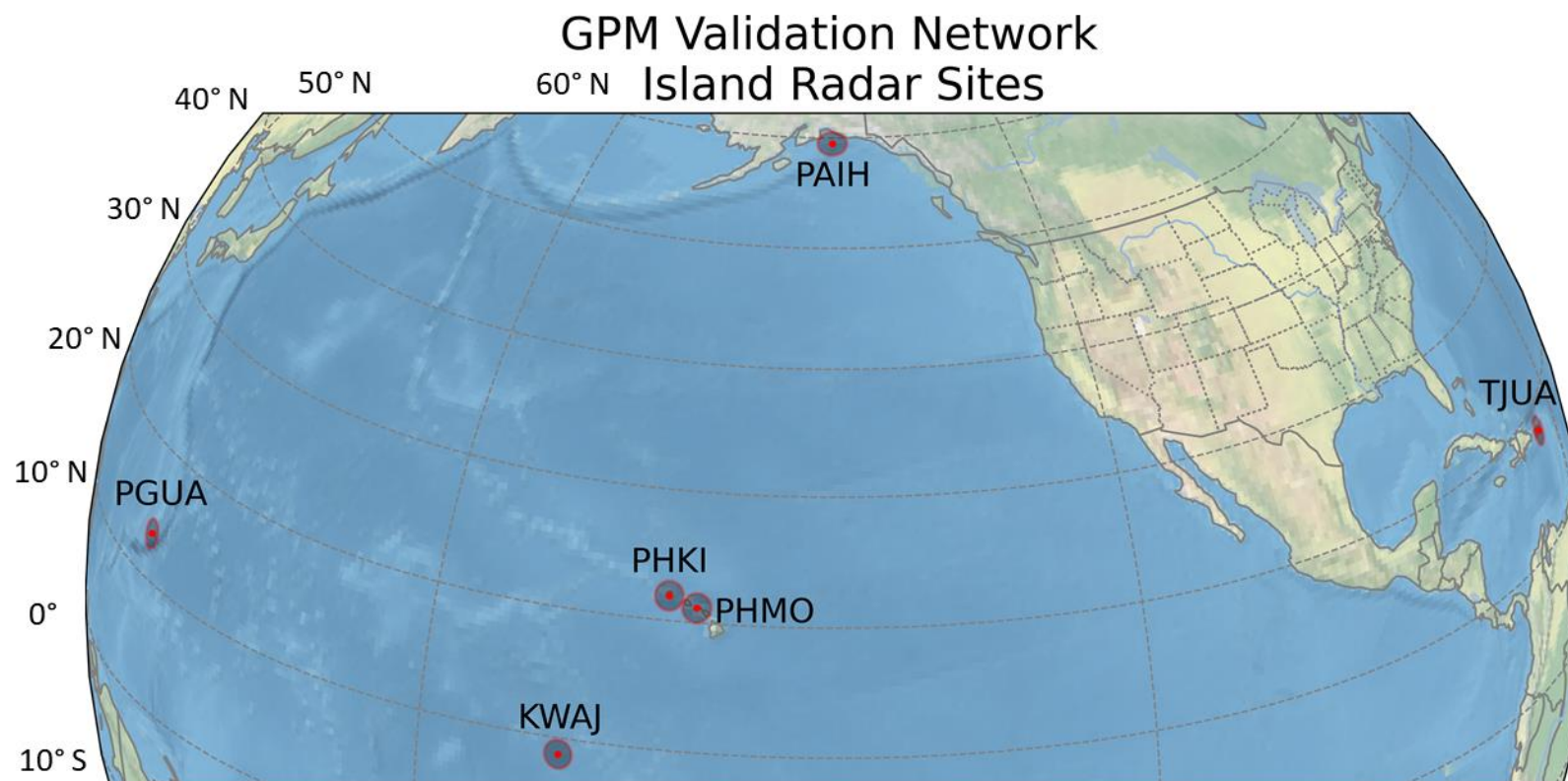
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Overview

- **What:** Evaluation of IMERG Version 7 (V07)
- **Where:** Alaskan and Tropical Oceans
- **When:** GPM Era (June 2014 – Oct. 2022)
- **Why:** First IMERG V07 oceanic validation
- **How:** GPM Validation Network V2.3
 - Comparison with ground-based radars

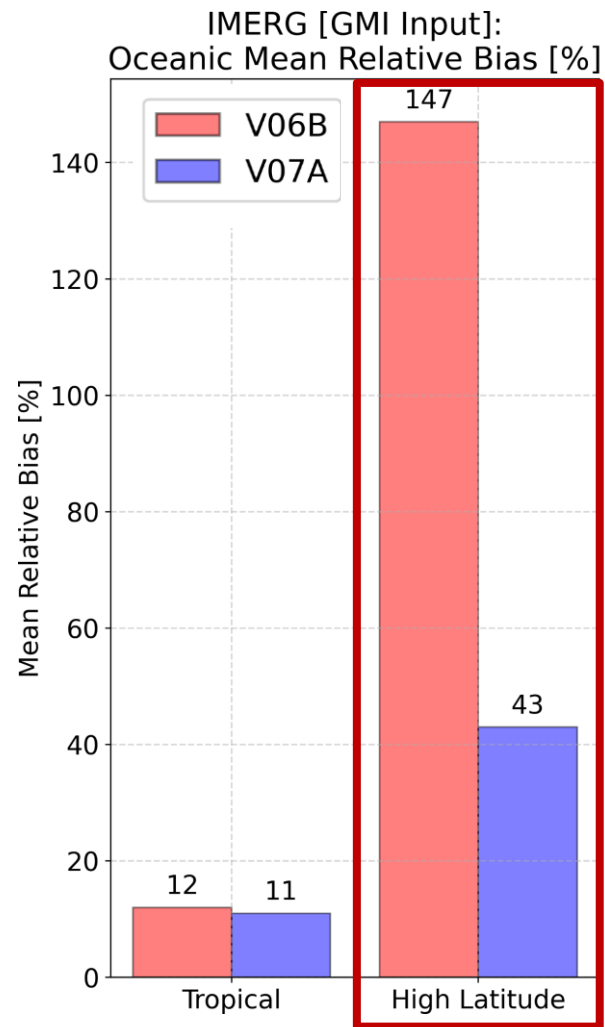
The GPM Validation Network

GPM 3D matchups with ground radars whenever GPM Core Observatory overpasses precipitation

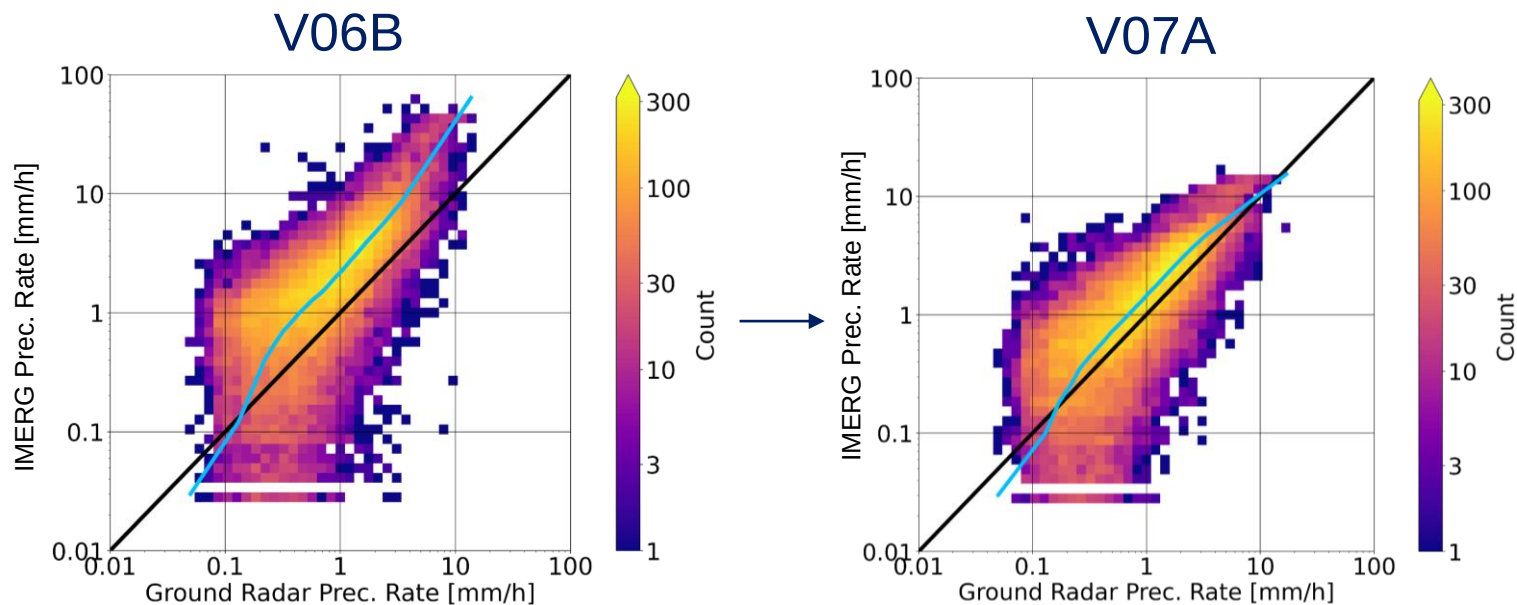


IMERG matchup validation files: Public release in 2024, for GMI overpasses only

Alaskan High-Latitude Oceanic Performance

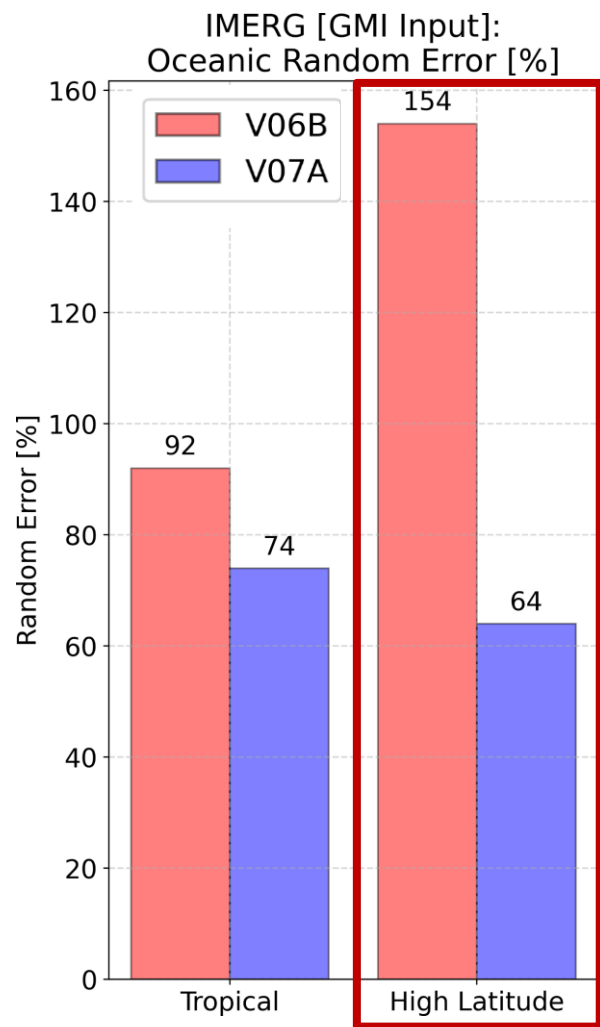


- IMERG V07 overestimates Alaskan oceanic precipitation by +43%
- Large improvement in bias compared to V06 (+147%)
- Cause of reduction: Improvements to GPCP in V3.2
 - GPCP contributes to GPROF intercalibration in high-latitude oceans

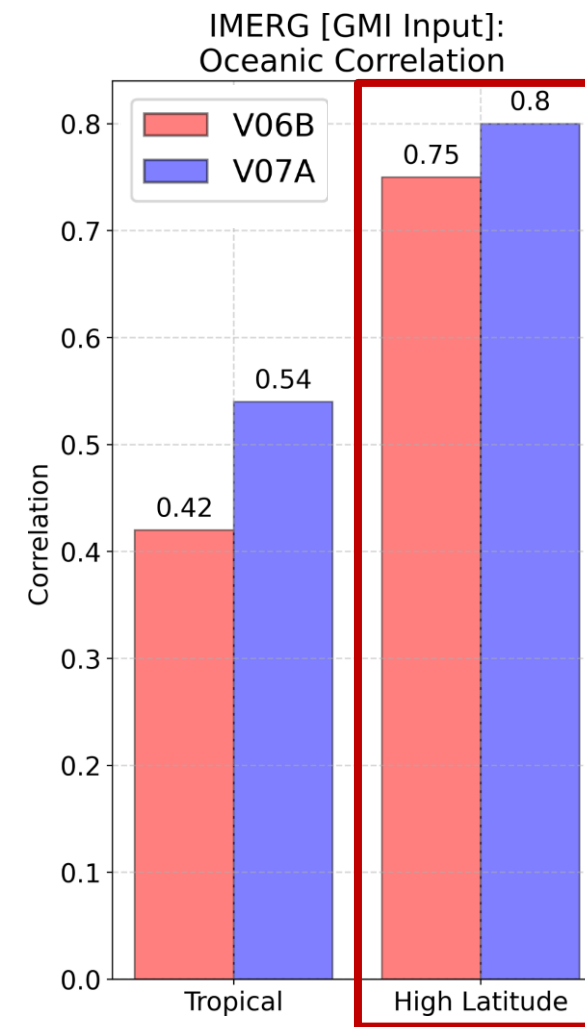


Sample: 31,363 (V07A); 29,887 (V06B)

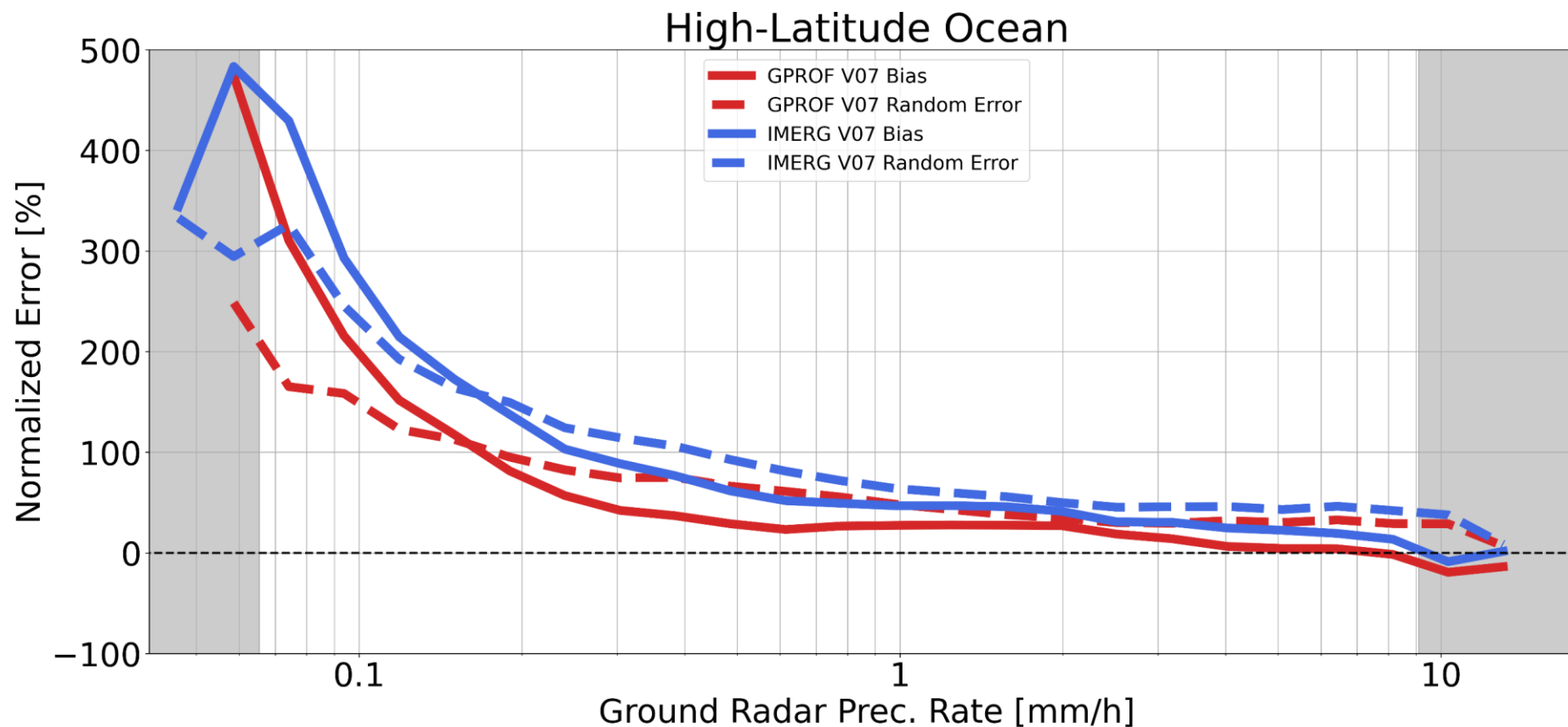
Alaskan High-Latitude Oceanic Performance



- IMERG V07 reduces high-latitude random error from 154% (V06B) to 64% (V07A)
- IMERG has strong correlation with Alaskan island radar, which increases from V06B (0.75) to V07A (0.8)



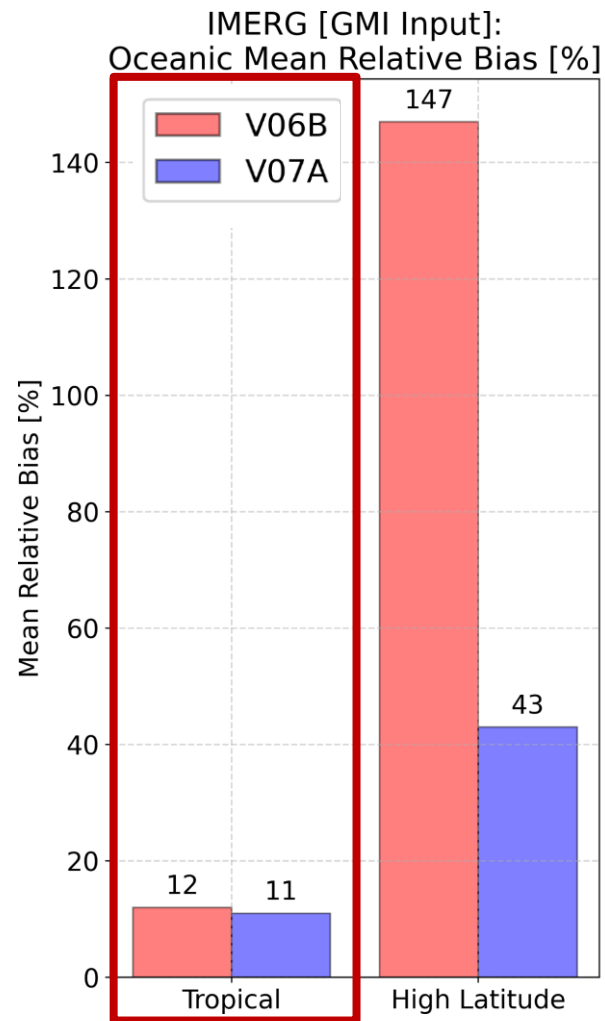
High-Latitude Oceanic Performance



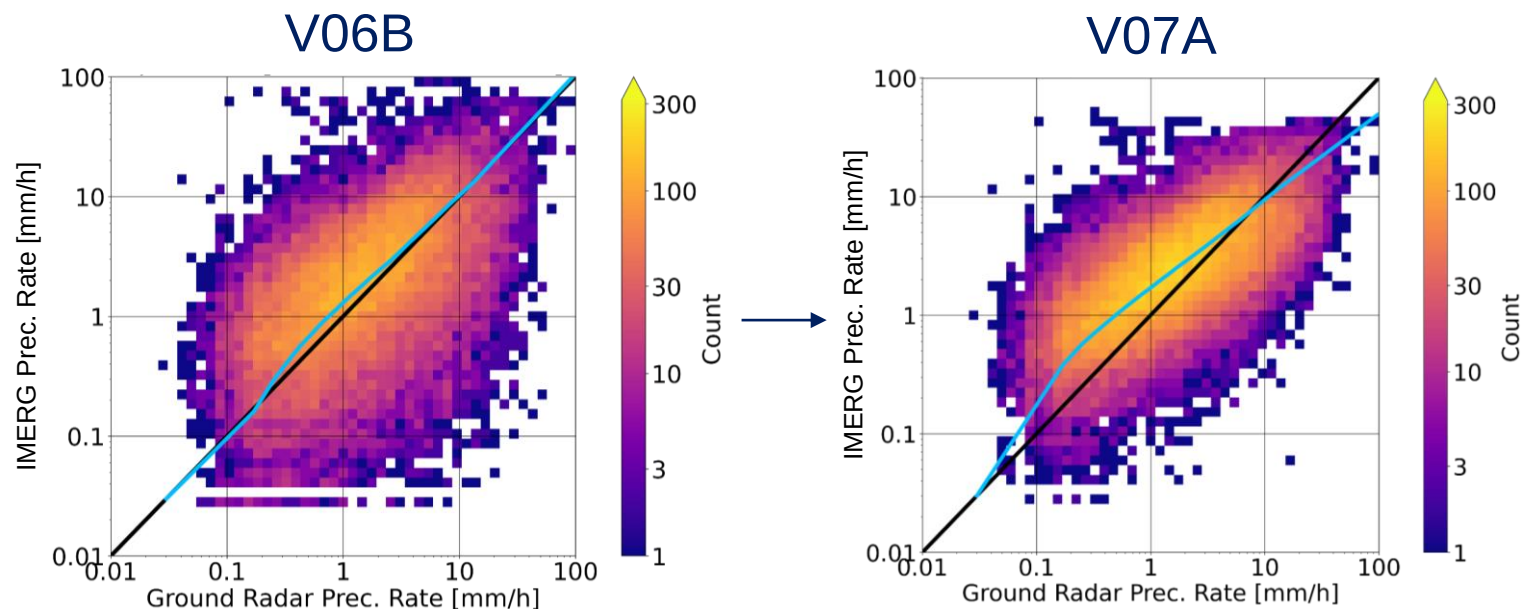
The bias and random error for IMERG and GPROF V07 reduce with increasing precipitation intensity.

GPROF outperforms IMERG across all Alaskan oceanic precipitation intensities for GMI overpasses.

Tropical Oceanic Performance

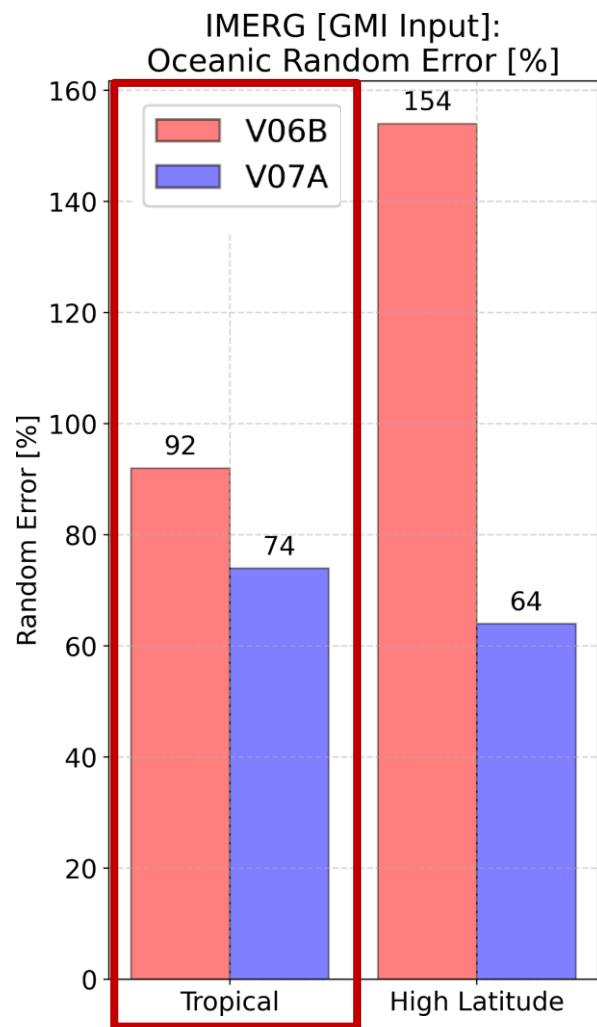


- IMERG V07 overestimates tropical oceanic precipitation by +11%
- Minor improvement in bias compared to V06 (+12%)

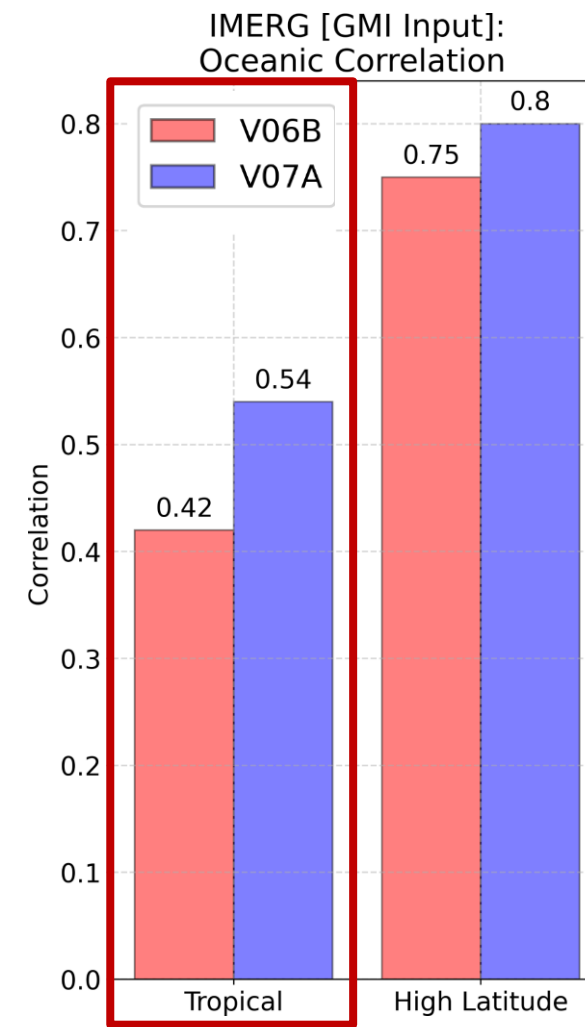


Sample: 33,332 (V07A); 27,845 (V06B)

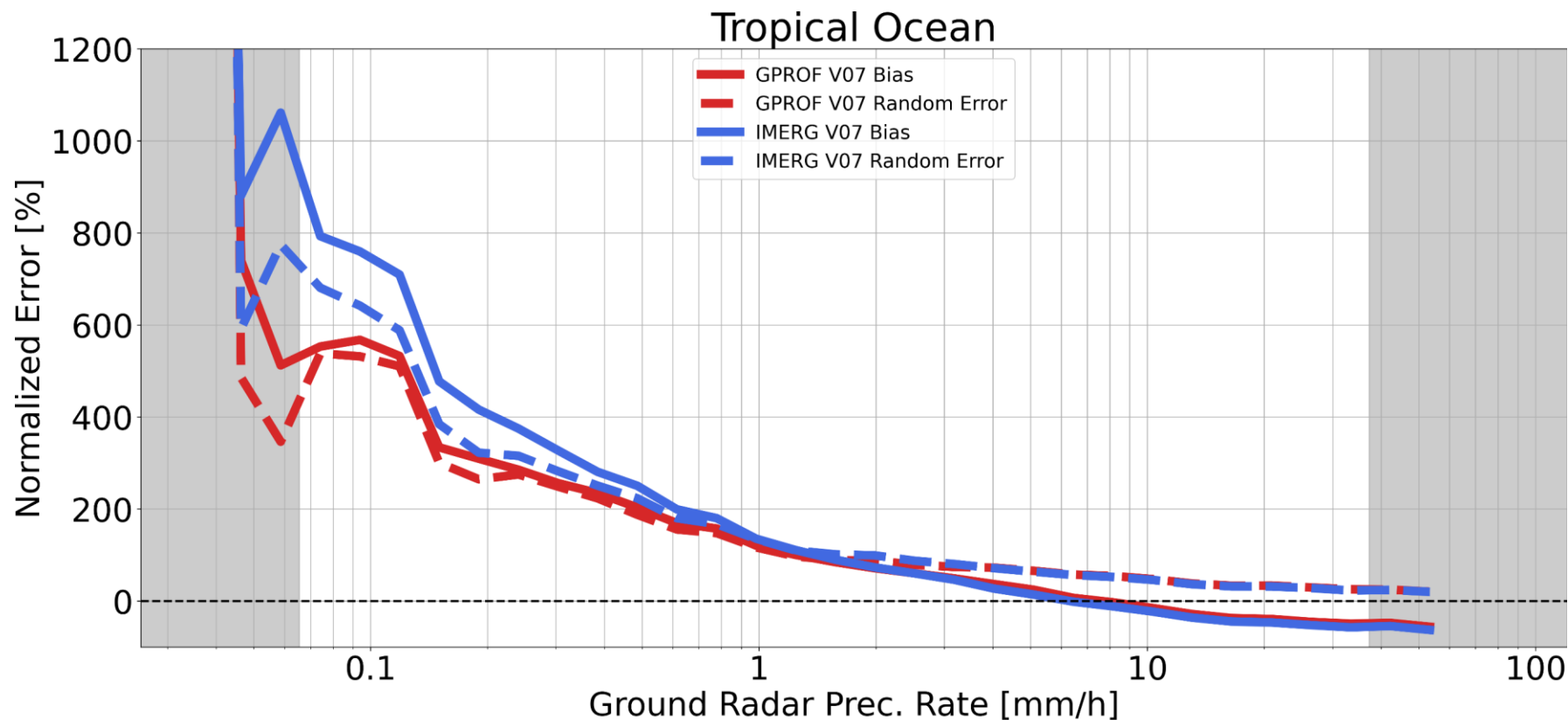
Tropical Oceanic Performance



- IMERG V07 reduces tropical random error from 92% (V06B) to 74% (V07A)
- IMERG increases correlation with tropical island radar from 0.42 (V06B) to 0.54 (V07A)



Tropical Oceanic Performance



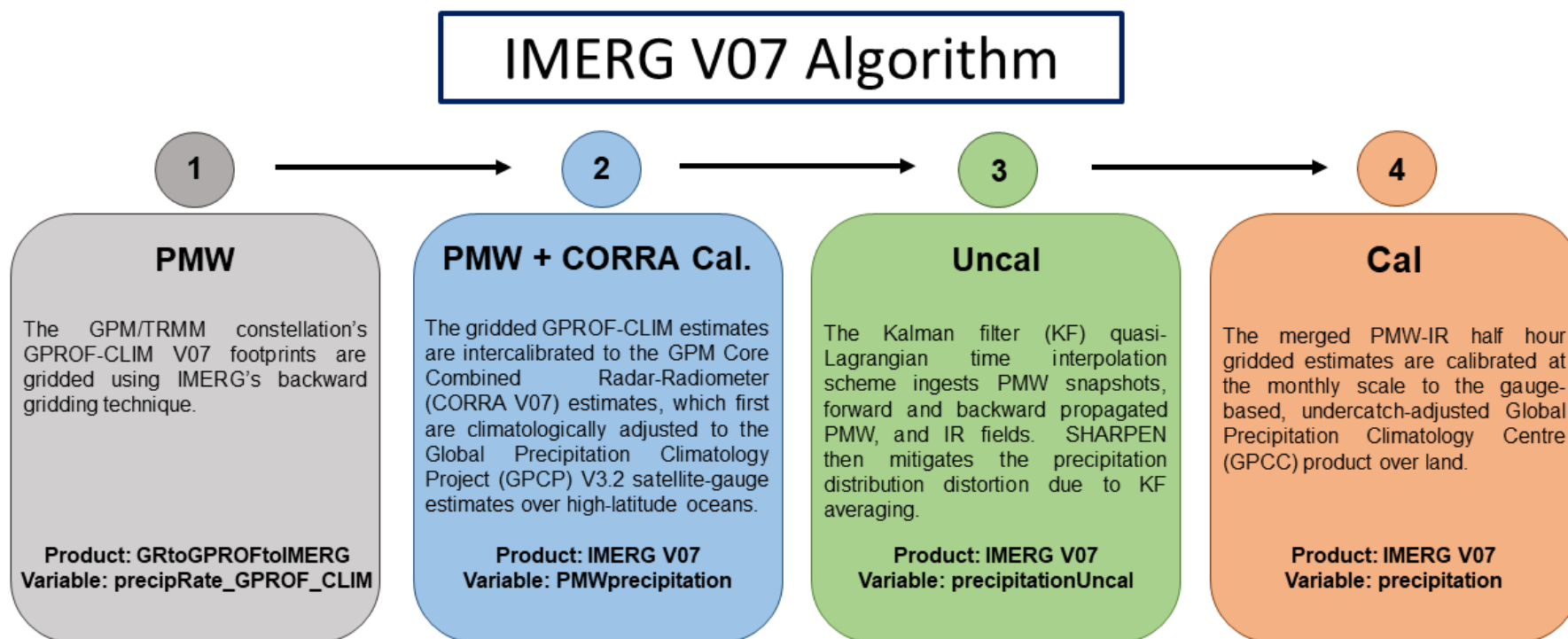
The bias and random error for IMERG and GPROF V07 reduce with increasing precipitation intensity.

GPROF generally outperforms IMERG across all tropical oceanic precipitation intensities for GMI overpasses.

Error Tracing from GPROF to IMERG

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Watters et al. – Oceanic Validation of IMERG V07 with the GPM Validation Network



Conclusions

- IMERG V07 improves on V06 for high-latitude and tropical oceanic precipitation [GMI overpasses only].
- Strong improvements in V07 statistics particularly over Gulf of Alaska.
- IMERG systematic and random errors decrease with increasing precipitation intensity.