Pwd: Mapir_51

The IASI Mineral Aerosol Profiling from InfraRed (MAPIR) version 5.1

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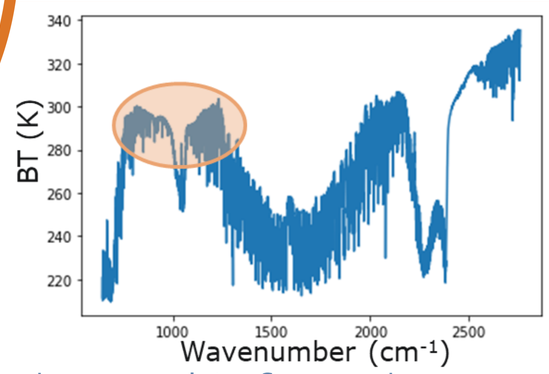
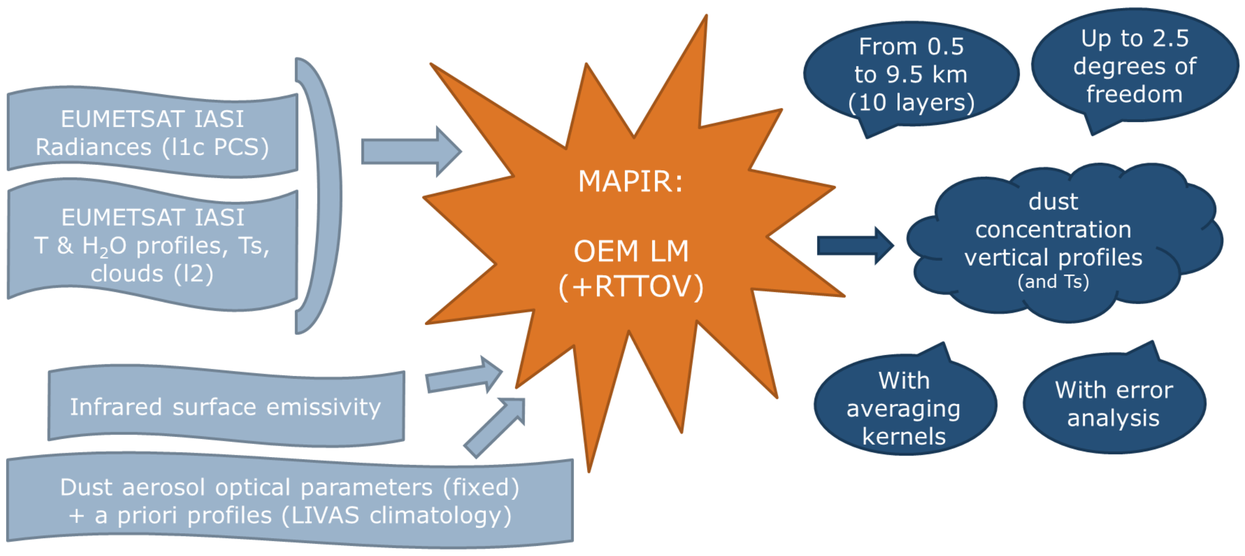
BIRA•IASB



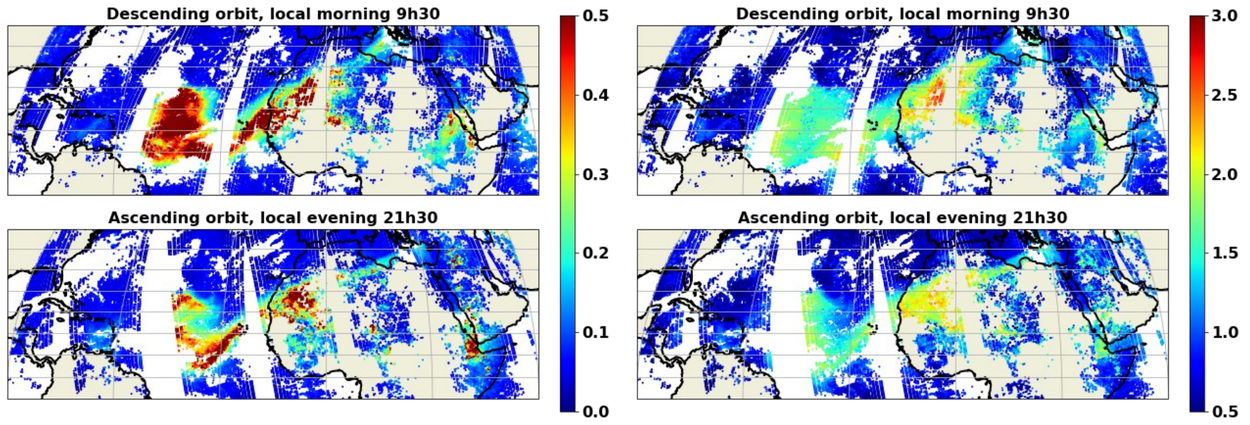
Aerosol sensitivity in the thermal infrared:

large (coarse/transported mode) mineral (dust, ash) particles

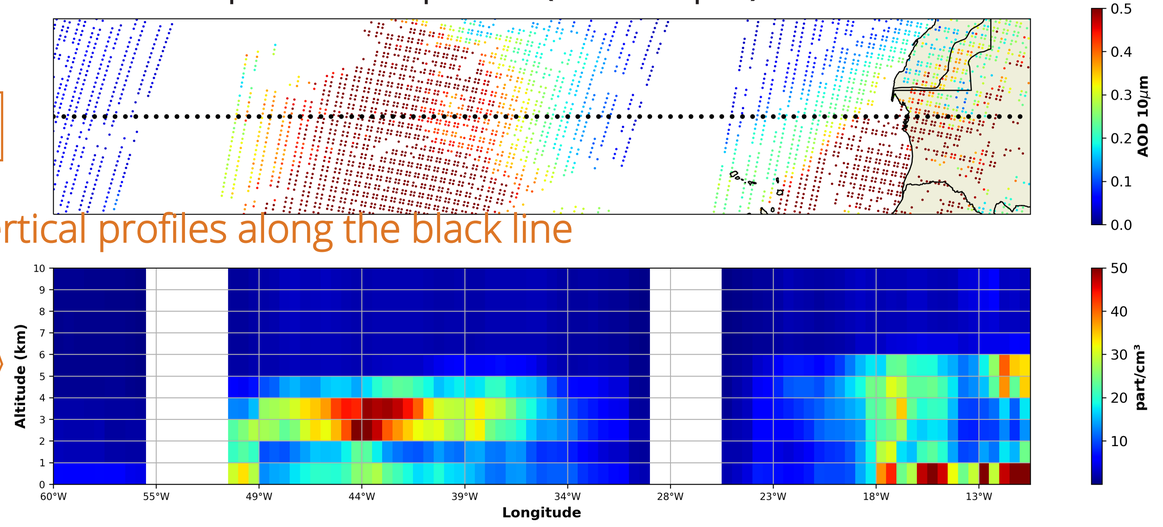
Mineral Aerosol Profiling from Infrared Radiances



The "Godzilla" storm, (20) June 2020



Zoom on a part of the plume (DOD 10µm)



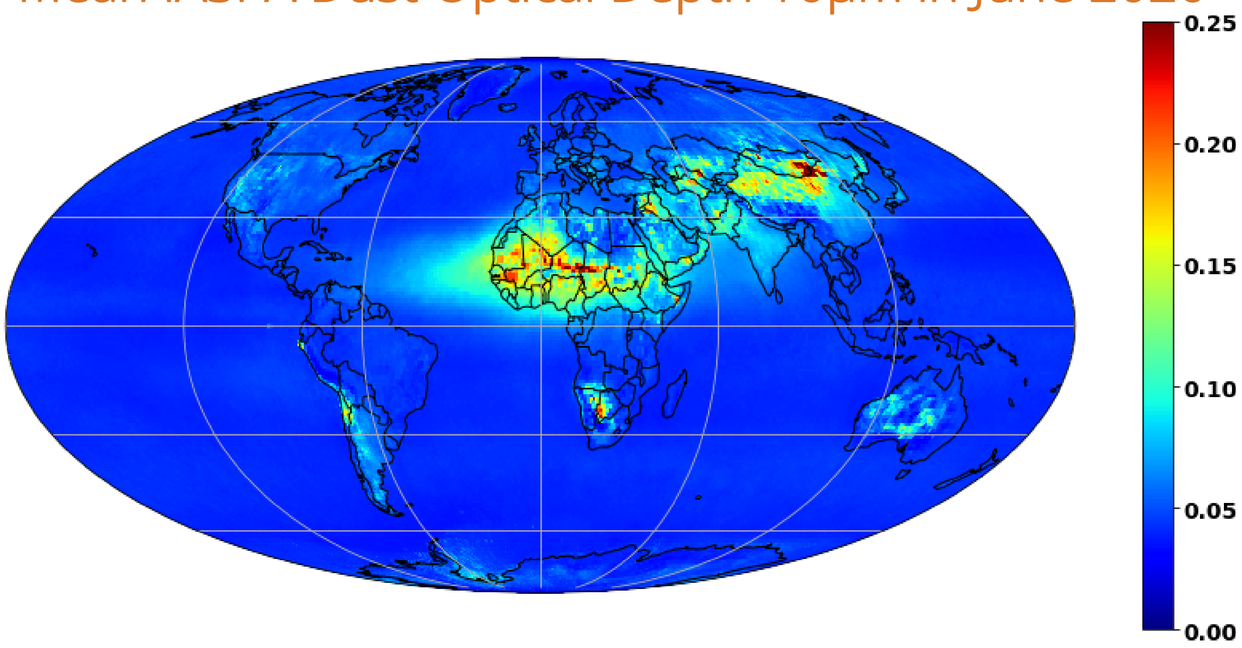
New in version 5.1

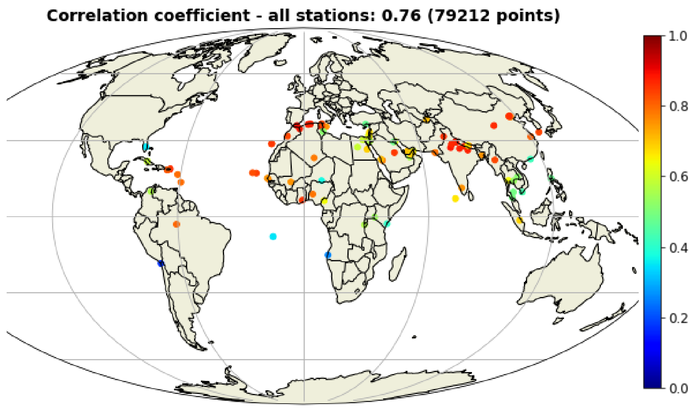
- Increased vertical range (10km)
- No pre-filtering
- Surface emissivity change
- Improved uncertainty
- Updated QC + cloud removal
- Some « technical » changes

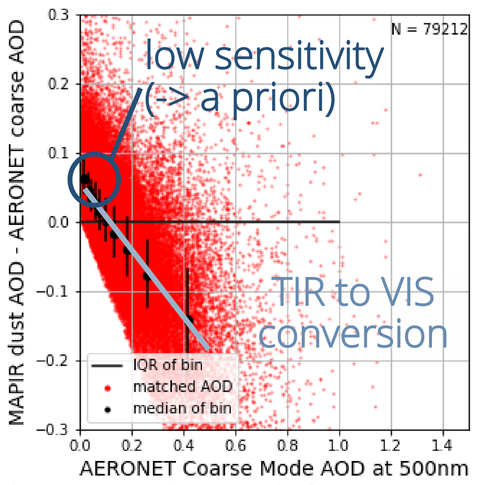
Comparison against AERONET

- IASI 10µm DOD **converted** to 550nm (only dust coarse)
- DOD550nm = **1.78***DOD10µm
- Max **25km**, **15 min**, 1 to 1 comp.
- **Coarse** SDA (all aer) AOD 500nm
- Med **CAOD station > 0.05**
- Added **QC** on AERONET (as Capelle et al 2018)

Mean IASI-A Dust Optical Depth 10µm in June 2020







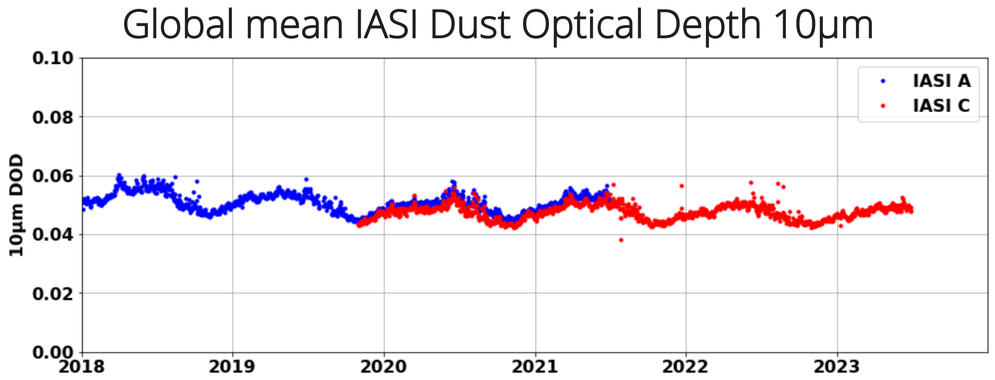
Correlation: 0.76
MAPIR v4.1: 0.66

Mean bias: 0.006 (std dev 0.08)
MAPIR v4.1: 0.04 (std dev 0.16)

Long-term consistency

- ☑ IASI-A: using the **reprocessed** l1c PCS FDR v1 & l2 CDR v1.1
- ? IASI-C: using the **OFL** (orbits) l1c PCS & l2 PWLR3
- ☒ IASI-A vs IASI-C: under investigation… there are differences!

Global mean IASI Dust Optical Depth 10µm



Conclusions

- MAPIR 5.1: overall better than earlier versions
- Global, no pre-filtering, more events, improved uncertainty & QC
- Wrt AERONET: better correlation, lower mean bias & std dev
- Overestimation of the low DOD (low sensitivity)
- Information on the vertical distribution (DOFs up to 2.5)
- More to do on profile validation

- Conversion of DOD 10µm to 550nm is uncertain
- Absolute value of the DOD can't be validated

- Long-term analysis with IASI-A is possible
- Merging IASI-A & IASI-C requires more research
- IASI-C long-term consistency to evaluate

Thursday 9:45

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