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# Progress on the BSC user case study on data assimilation

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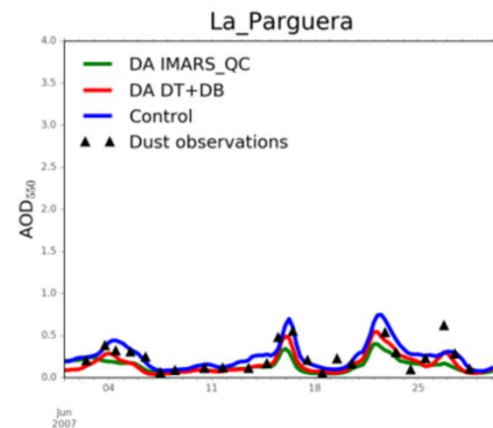
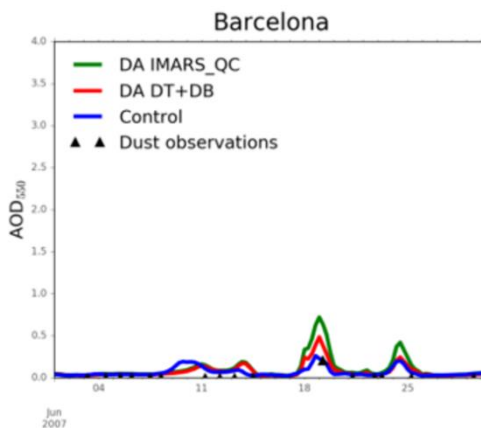
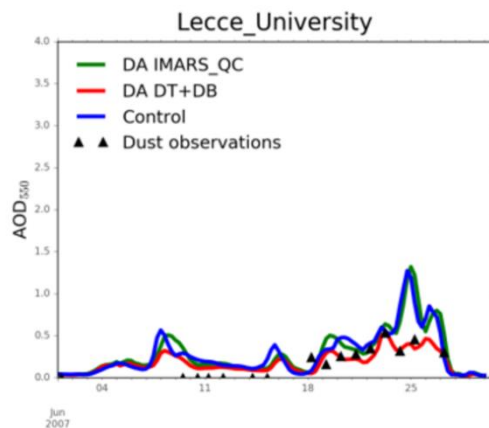
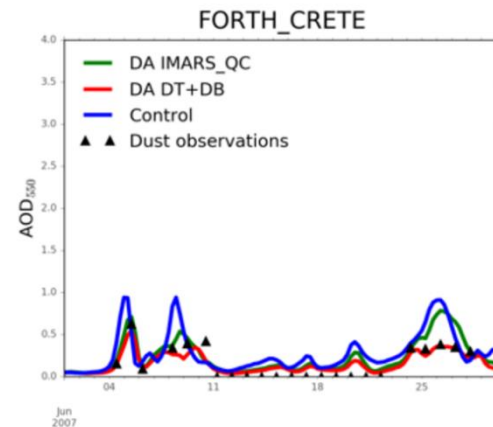
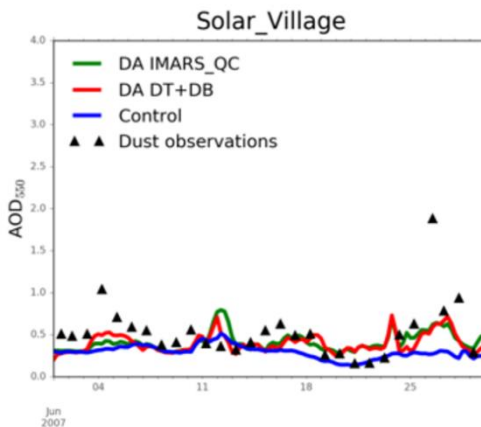
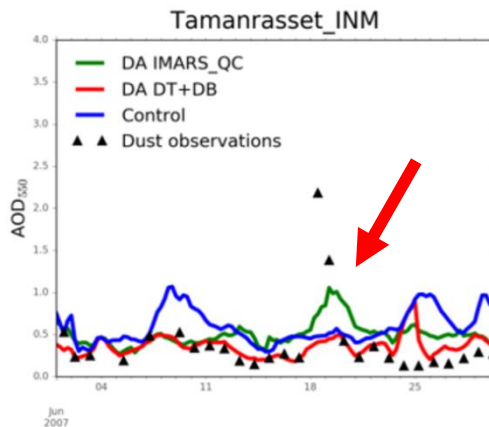
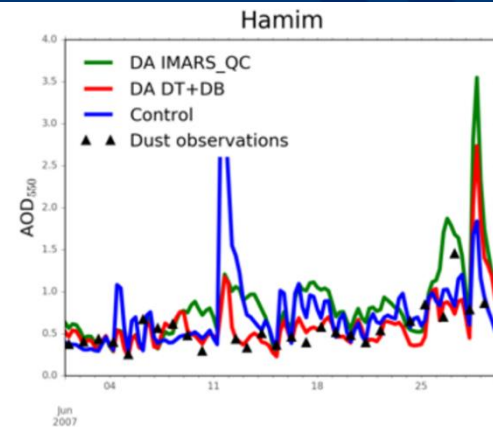
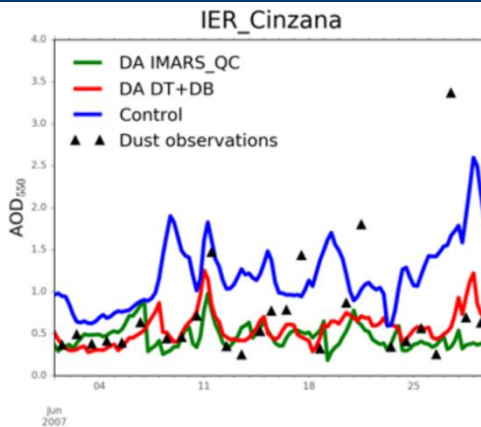
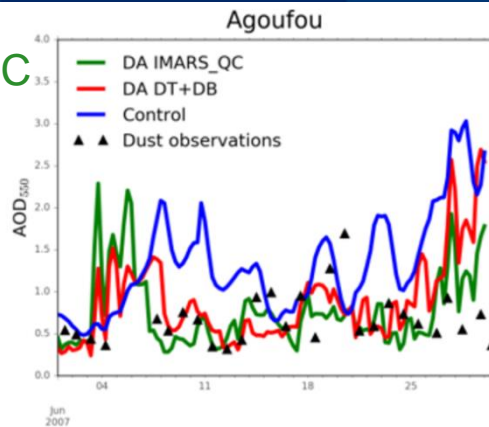


# Summary of the results presented at the last meeting

- Dust AOD from IMARS v5.2 (L3 dataset) has been ingested in the BSC assimilation system;
- A quality control was applied on the observations based on thresholds on effective emission temperature of dust layer and on AOD;
- Preliminary tests showed evidence of a positive impact of the IASI IMARS dust product over land.

# Summary of the results presented at the last meeting

IMARS\_QC



# New simulations with the assimilation of IMARS dust AOD

Assimilation of IMARS v5.2 dust AOD (sub-daily Level 3 aggregated dataset at 1° resolution) with:

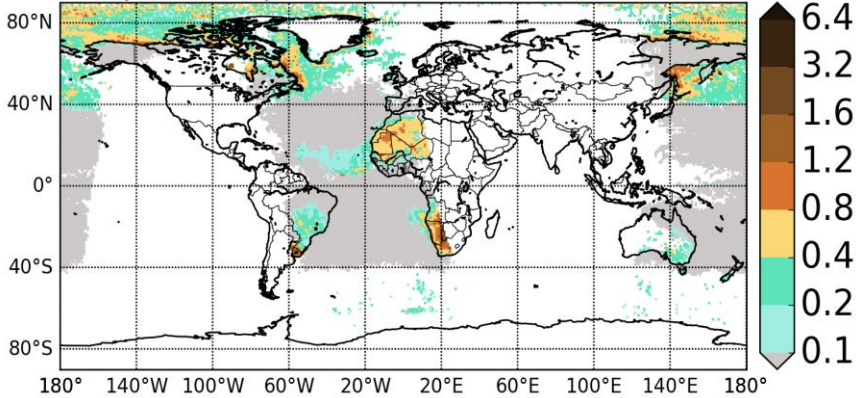
- the use of a quality filtering in the aggregated L3 product (including only observations with high or highest quality level in the aggregation);
- bug-fix in the uncertainty calculation.

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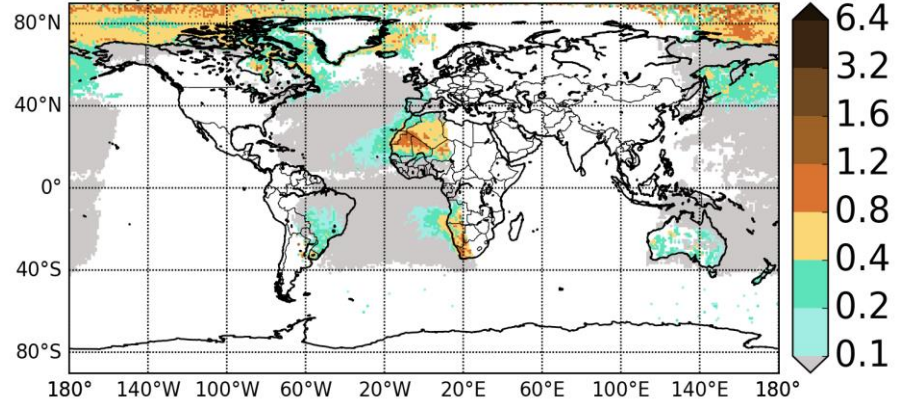
IMARS v2.5

July 2007

AOD (550nm) IASI DLR IMARS L3 200706

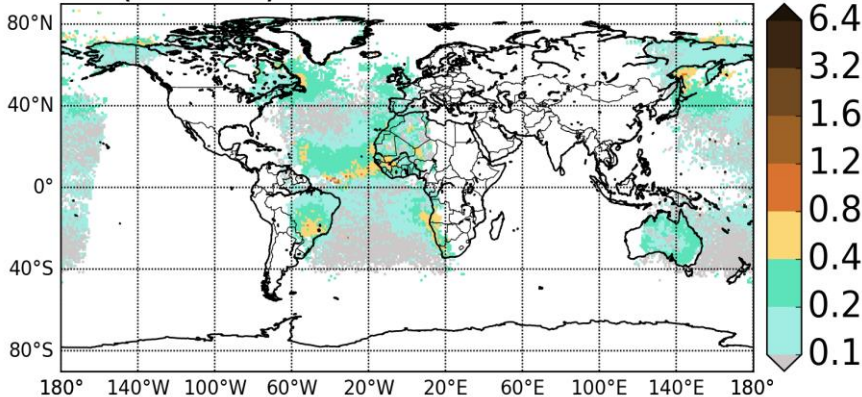


AOD (550nm) IASI DLR IMARS L3 200707

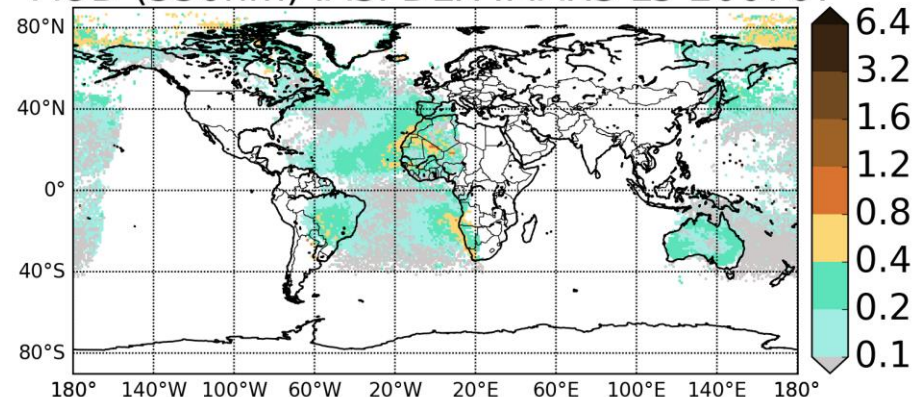


IMARS v2.5 with quality filtering and bug-fix

AOD (550nm) IASI DLR IMARS L3 200706



AOD (550nm) IASI DLR IMARS L3 200707



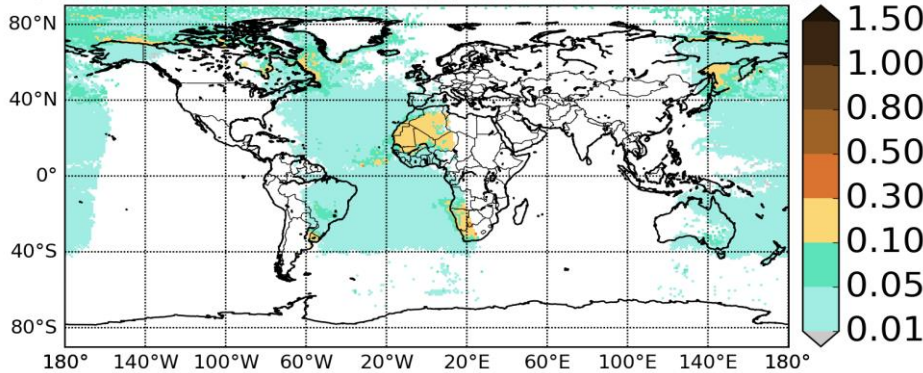
- higher AOD over the ocean
- much lower AOD over Africa and in general higher over other lands
- smoother transition of AOD from land to ocean

June 2007

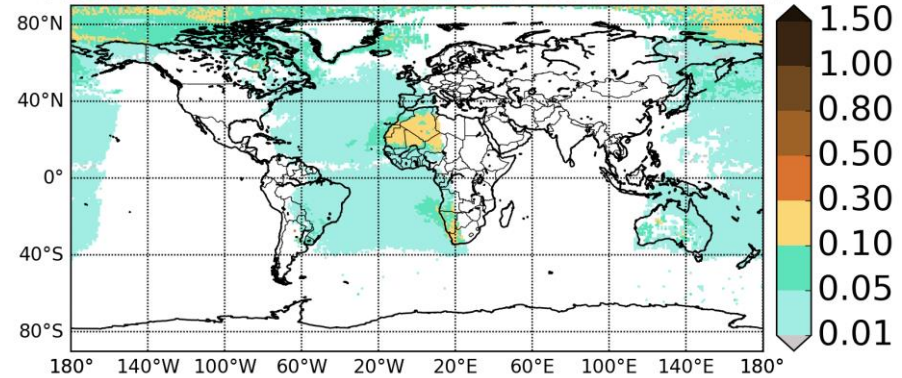
IMARS v2.5

July 2007

AOD Uncert. IASI DLR IMARS L3 200706

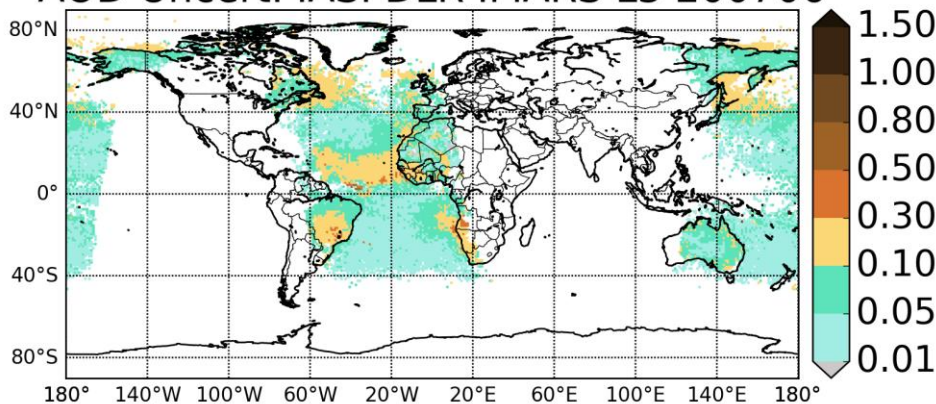


AOD Uncert. IASI DLR IMARS L3 200707

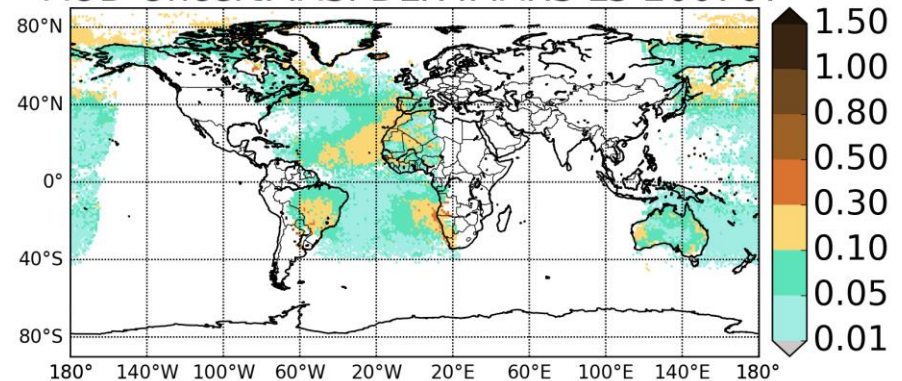


IMARS v2.5 with quality filtering and bug-fix

AOD Uncert. IASI DLR IMARS L3 200706



AOD Uncert. IASI DLR IMARS L3 200707

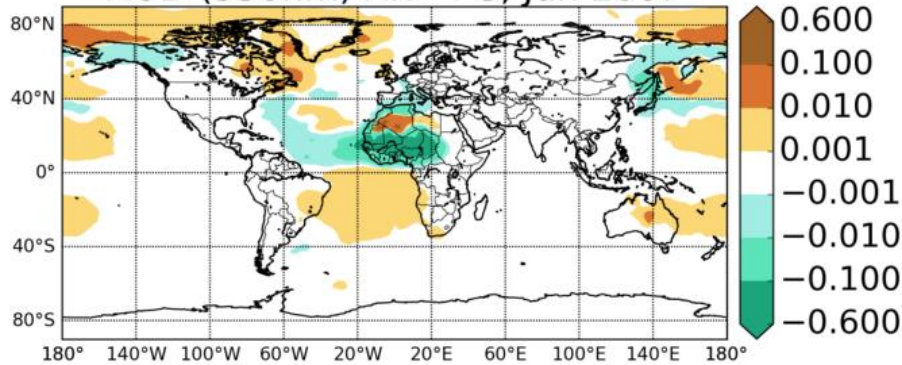


- Better characterization of uncertainty over the ocean

# Mean analysis increments

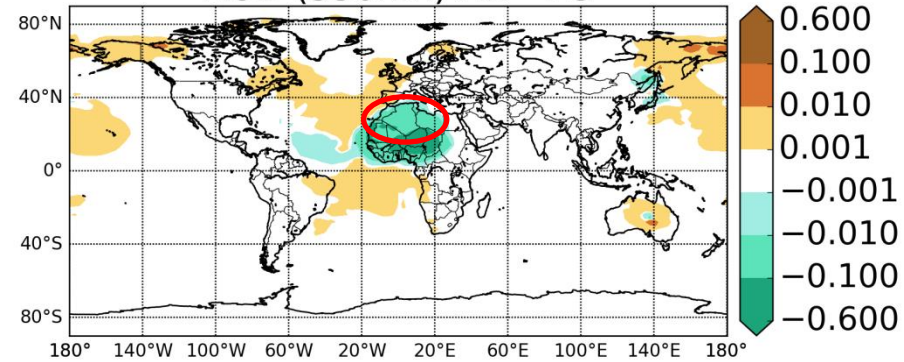
## IMARS Exp

AOD (550nm) AN - FG, Jun 2007



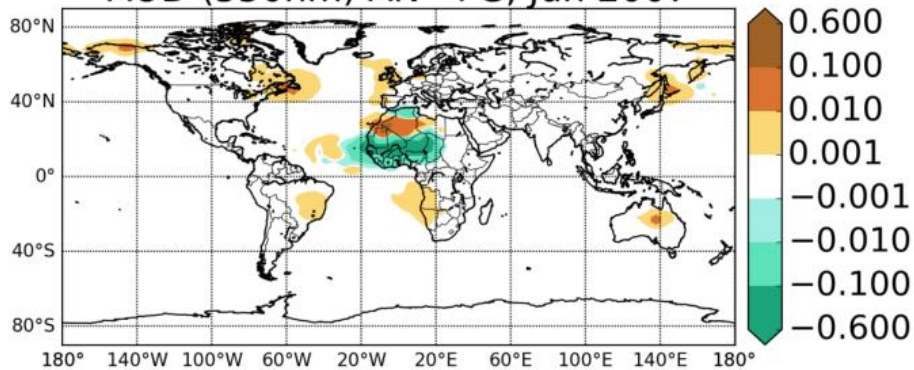
## IMARS\_QF Exp

AOD (550nm) AN - FG



## IMARS\_QC Exp

AOD (550nm) AN - FG, Jun 2007

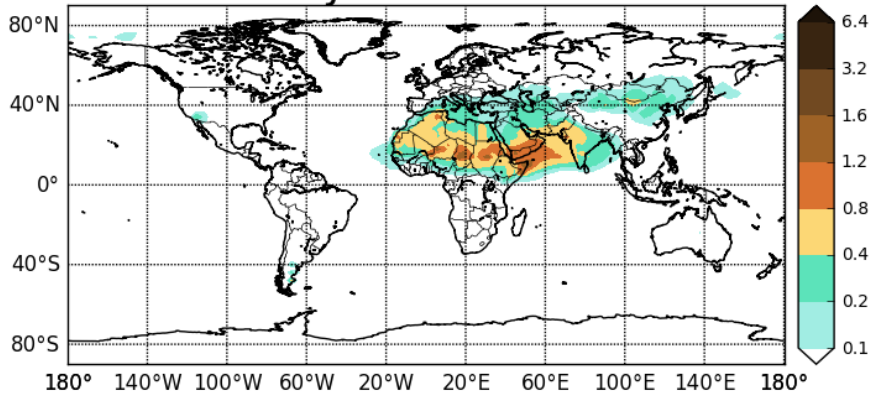


Applying a quality filtering in the L3 aggregated product produces negative increments (dust removal) over the north-west Sahara ....

# Monthly mean dust AOD analysis

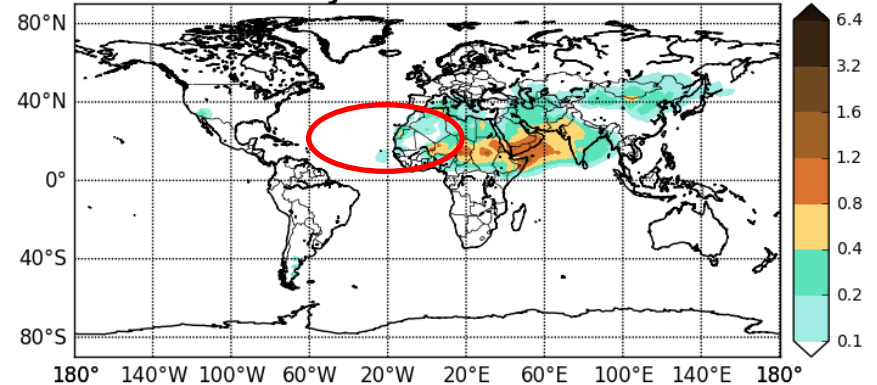
## IMARS Exp

Dust AOD (550nm), DA Simulation (IMARS)  
June 2007



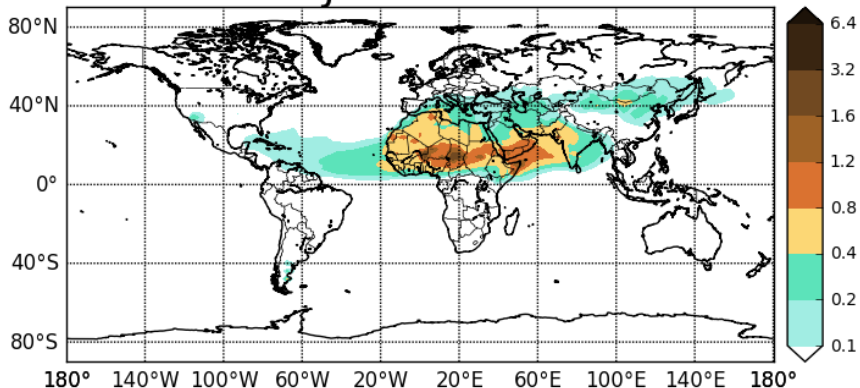
## IMARS\_QF Exp

Dust AOD (550nm), DA Simulation (IMARS QF)  
June 2007



## IMARS\_QC Exp

Dust AOD (550nm), DA Simulation (IMARS)  
June 2007



... and consequently produces an underestimation of dust in the analysis (also in the Atlantic transport)



- The use of retrievals with only high and very high quality flags is detrimental for the dust analysis. DLR is currently processing a L3 product without this filter;
- The interaction between product developers and BSC keeps being fundamental and useful to both sides;
- Contacts have been made with Lieven, Sophie and Virginie to test other IASI dust retrievals.



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Thank you!