

Optimized Aerosol Retrieval with Bayesian Model Selection Strategy for TROPOMI/S5P

Lanlan Rao^{1,2}, Jian Xu³, Dmitry S. Efremenko¹; Diego G. Loyola¹; Adrian Doicu¹

1 Remote Sensing Technology Institute, German Aerospace Center (DLR), Germany

2 Department of Aerospace and Geodesy, Technische Universität München (TUM), Germany

3 National Space Science Center, Chinese Academy of Sciences, China

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Knowledge for Tomorrow



Overview

- **Aerosol retrieval**

- Targets

- Aerosol Layer Height (ALH) and Aerosol Optical Depth (AOD)

- Data

- TROPOMI/S5P O₂A band (758-771nm)

- Retrieval algorithm

- Radiative transfer model
 - Tikhonov method

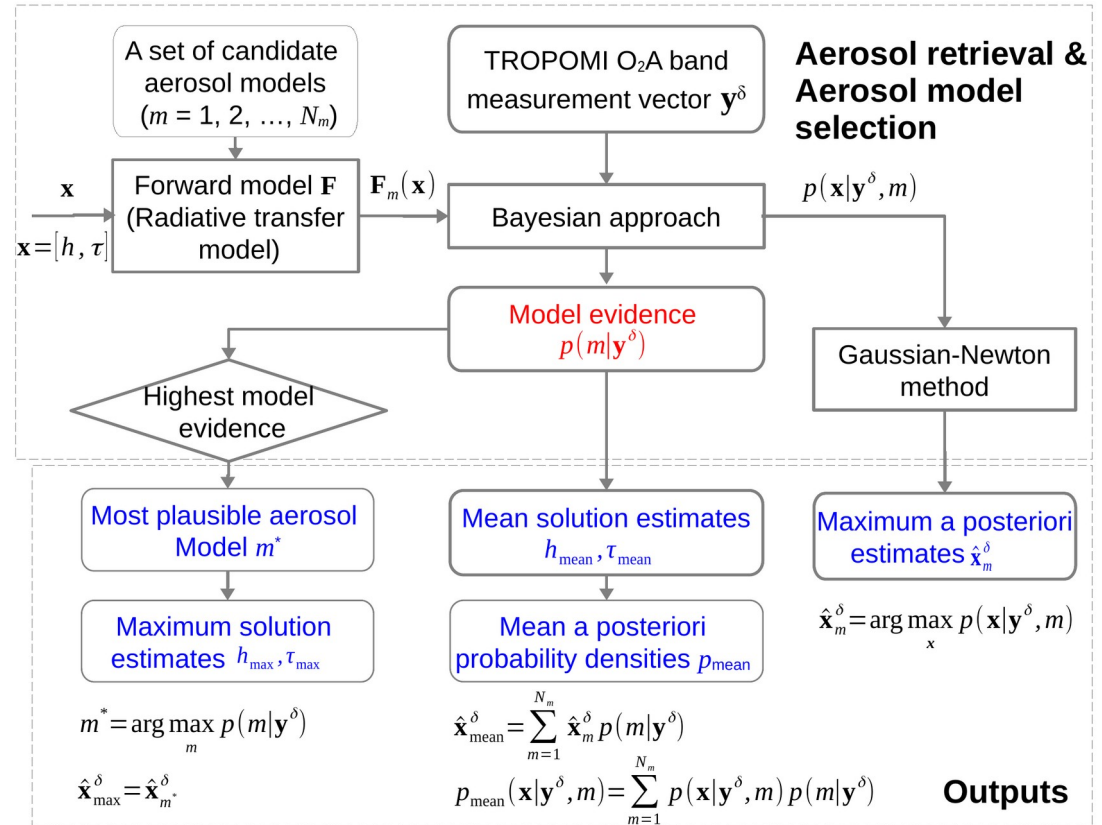
- **Bayesian model selection strategy**

- Model selection

- Model evidence

- Results

- Maximum solution estimates
 - Mean solution estimates



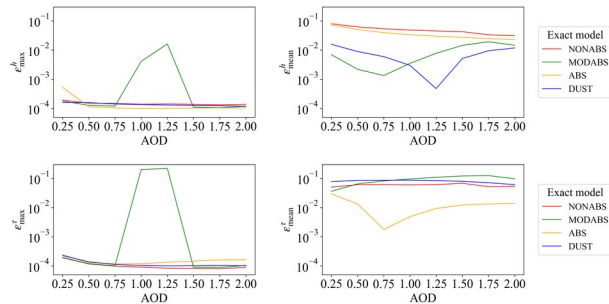
Test with synthetic and real measurements

- **Aerosol models**

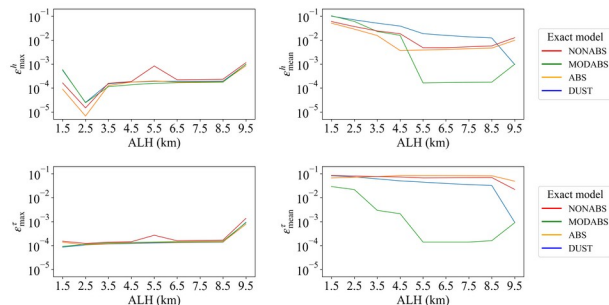
- Set 1, from MODIS Dark Target algorithm
 - Set 2, from OMI OMAERO algorithm

- **Test with synthetic measurements**

- Relative errors versus τ_e



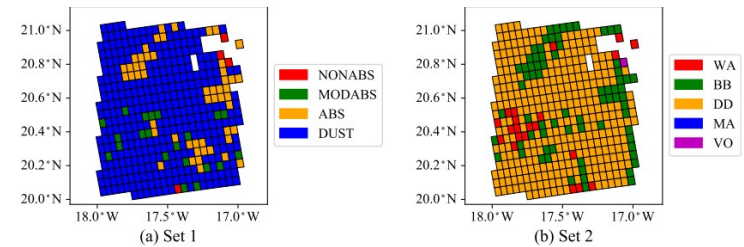
- Relative errors versus h_e



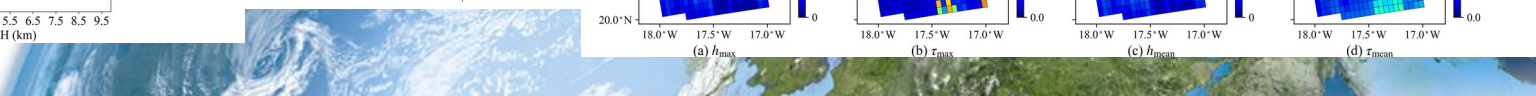
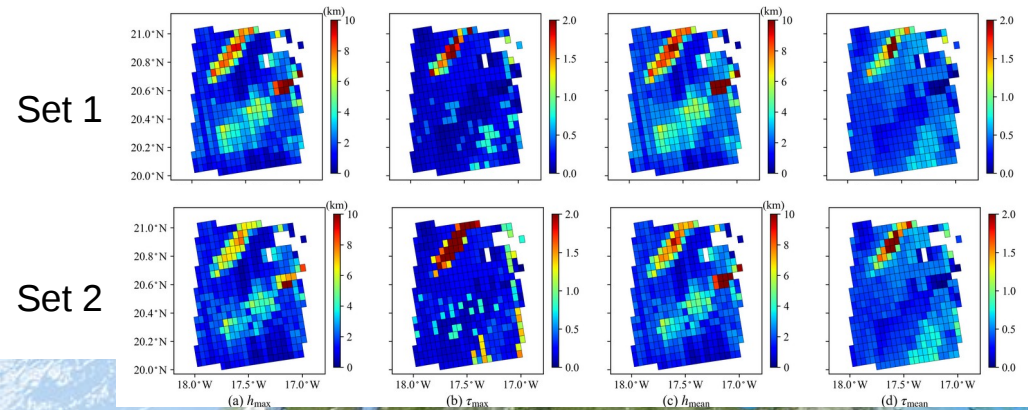
- **Test with real measurements**

- **Desert dust case in Sahara (6th June 2020)**

- Aerosol model with highest model evidence



- The maximum solution estimates and the mean solution estimates



Thank you!

