

Tropospheric *BrO* & Limb Clouds

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

²Belgian Institute for Space Aeronomy (IASB-BIRA), Bruxelles , BELGIUM

³Institute of Environmental Physics, University of Bremen (IUP), Bremen, GERMANY

14/15 June 2016

<ロト <四ト <注入 <注下 <注下 <

Tropospheric BrO: activities since MTR Meeting

- complete verification dataset processed by BIRA
- in order to focus on possible inconsistencies in the operational prototype, BIRA used for the processing as much operational auxiliary data as possible:
 - cloud fractions and top heights
 - tropopause heights
 - total O3 and NO2STRATO
 - surface albedo and surface height
- implementation into the operational environment already started (interfaces to deal with LUTs containing, e.g. stratospheric *BrO* climatology created)
- current implementation status presented at EGU General Assembly and LPS (posters)

・ロト ・ 理 ト ・ ヨ ト ・

Tropospheric BrO: filtering criteria

- no ascending node
- Ino backscan pixels
- 3 AMF_{TROPO} > 0.5
- Surface albedo > 0.11 ⇒ pixel kept, CF and CTH set to zero)
- SZA < 80°</p>
- Ino outliers (SCD_{TOTAL} < -1e14)</p>
- no SAA (5 45° S; 25 65° W)
- Ouring the comparison we found that using OCRA cloud product BIRA did not corrected *CF* over snow/ice (as described in item 4). Such pixels turned out not to be suitable for the comparison ⇒ filtered out (~5% of the data)







- good agreement between two datasets
- occasionally large differences
- explanation below

Remote Sensing Technology Institute



Remote Sensing Technology Institute

Tropospheric BrO & Limb Clouds

BrOTROPO: scatter plot & difference histogram



- correlation coefficient 0.980, slope 1.006
- intercept $-5.42 \cdot 10^{12}$ molec $\cdot cm^{-2}$
- average difference 5.1 − 5.3 · 10¹² molec · cm⁻²
- absolute difference (median) 33%

Deutsches Zentrum DLR für Luft- und Raumfahrt e.V.

AMF_{TROPO} vs CTH VERIFICATION DATA SET; CF > 0.1



Deutsches Zentrum

Remote Sensing Technology Institute

Tropospheric BrO & Limb Clouds

BrO_{TROPO}: Summary

- comparing the operational BrO_{TROPO} dataset with BIRA reference, the major issue revealed is very different AMF_{TROPO} for pixels where CTH coincides with the BrO_{TROPO} bulk (between ~3 and 8 km). The work to find out the reason for that is going on.
- correlation between the two BrO_{TROPO} datasets ($R^2 = 0.98$). Absolute difference (median) and relative difference are $5.13 \cdot 10^{12}$ and 33%, correspondingly
- difference caused by an offset inherited from BrO_{TOTAL} product and AMF_{TROPO} issue (for CTHs between ~3 and 8 km)
- the implementation of the prototype code into the operational processor is intensively continuing
- also a check of the operational BrO_{TROPO} behaviour with albedo used in the BIRA scientific processor is planned

Deutsches Zentrum für Luft- und Raumfahrt e.v

Limb Clouds: activities since MTR Meeting

- at MTR it was decided not to implement the new limb cloud algorithm (developed by Patty)
- instead the existing operational SCODA limb cloud algorithm has to be updated
- the required changes are:
 - geographical constraints for PSCs
 - maximal solar zenith angle for which the retrieval is still performed
 - maximal allowed and warning heights for all types of clouds
 - thresholds for detection of all types of clouds
- all required changes implemented into the operational processor. Verification data set processed
- reference IUP data set (213 orbits) delivered to DLR
- comparison pending

3

・ロト ・ 理 ト ・ ヨ ト ・