

Status Operational Processor L2 V7 Limb Clouds and BrOTROPO

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L2 WP3210: Improve limb cloud flagging

• existing operational SCODA limb cloud algorithm updated:

- 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
- wavelength for the ice clouds detection
- verification data set processed with the new settings
- results are compared to the IUP reference
- ATBD updated accordingly



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- wavelength pair for the ice cloud detection 1552/1685 nm
- their CIRs are extremely sensitive to pixel problems near 1680 nm
- IUP applies very strict passing citeria to limb radiances (strong negative and positive radiances are thrown away, so that sometimes only 1-2 pixels remain)



Water Clouds: Maximal CIRs vs Latitude



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Ice Clouds: Maximal CIRs vs Latitude



Polar Stratospheric Clouds (PSC): Maximal CIRs vs Latitude



Heights of Maximum CIRs





 fraction of observations with equal cloud heights:

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- 89.3% for water clouds
- 95.6% for ice clouds

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99.3% for PSCs

Cloud flags: Water clouds

		Flags IUP				
Flags DLR	0	1	2	9	4	5
0	1174(6.1%)	94(0.5%)	2	0	1	0
1	10(0.1%)	11263(58.9%)	217(1.1%)	0	117(0.6%)	0
2	0	2	4238(22.2%)	0	0	0
3	38(0.2%)	0	0	162(0.3%)	0	0
4	0	88(0.5%)	0	18(0.1%)	1785(9.3%)	5
5	0	0	4	0	0	33(0.2%)

0 - no clouds

- 1 partially cloudy
- 2 partially cloudy&large CIR (>2.2)
- 3(9 in IUP) bad data or cloud top height too heigh
- 4 partially cloudy, thick or multiple layers
- 5 partially cloudy, thick or multiple layers (CIR>2.2)
- deviation (sum of non-diagonal elements): 3.1%

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Cloud flags: ice clouds



- 0 water cloud
- 1 ice cloud
- 2 bad data (MAXHEIGHT_ICL is greater than the warning tangent height)
- 3(9 in IUP) strange case (MAXVAL_ICL is greater than the upper bound for the CIR)
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- deviation (sum of non-diagonal elements): 5.5%

Cloud flags: polar stratospheric clouds (PSC)



- 0 no PSC
- 1 PSC
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- deviation (sum of non-diagonal elements): 0.1%



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Summary

- very good agreement of CIRs for all types of clouds
- 1-2% of CIRs for ice clouds in the DLR data are outlayers (CIRs=5..150)
- same cloud flags:
 - in 97% for water clouds
 - 94.5% for ice clouds
 - 99.9% for PSCs
- same cloud heights:
 - in 89.3% for water clouds
 - 95.6% for ice clouds
 - 99.3% for PSCs
- differences could be explained by slightly varying treatment of bad pixels

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L2 WP3240: Tropospheric BrO

- implementation of the BIRA scientific algorithm into the SGP finished
- BIRA provided the reference data set with the operational input parameters:
 - cloud fractions and top heights
 - tropopause heights
 - total O₃ and NO^{STRATO}
- no further requests for input to BIRA
- operational results are still rather preliminary
- only one orbit has been tested
- debugging is going-on

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• for 88.2% of pixels difs $< 1 \cdot 10^{13}$





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BrOTROPO: Summary

- implementation of the BIRA scientific algorithm into the operational environment finished
- debugging is going-on (so far, using one orbit)
- offset (5 · 10¹²) between DLR and BIRA (inherited from the BrO total columns)
- additional differences caused by differing AMF_{TROPO} (reason under investigation)
- ATBD updated
- no further reference data set from BIRA side is needed



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