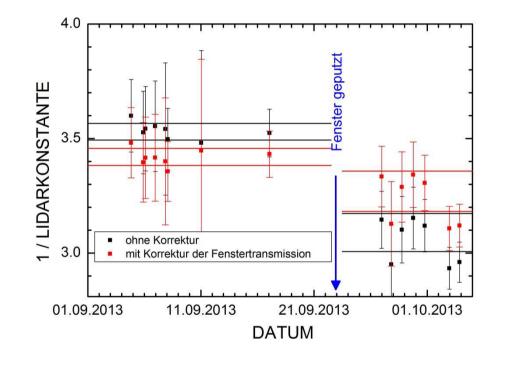


Does changes in the window transmission affect the measurements?

Margit Pattantyús-Ábrahám Meteorological Observatory Hohenpeissenberg DWD, Germany



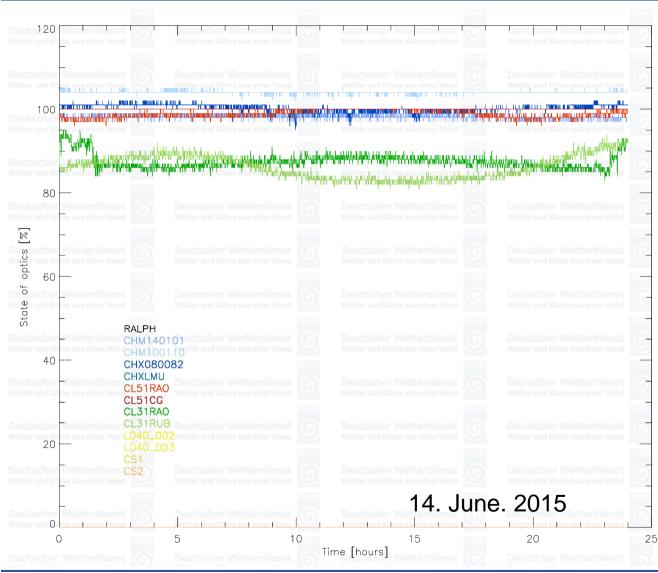
Motivation



Leipzig, CHM vs Polly 8km distance



Window transmission: housekeeping dataeutscher Wetterdienst Wetter und Klima aus einer Hand



Mostly around 100% (optimal)

DWD

0

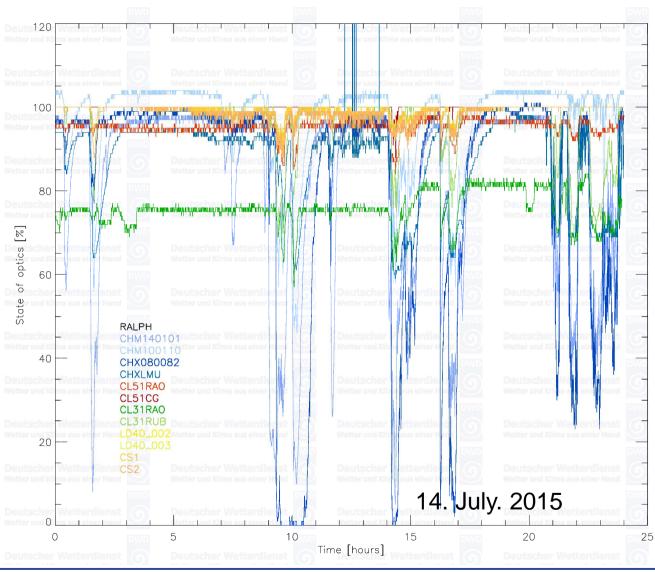
- Some of them has values over 100% → problem of initialization
- CL31s tend to decrease WT
- All ceilometers get lover WTs: deposition
- Effect on measurements?



Changing WT: Rain







- Drop of WT at all instruments
- Major changes at • Lufft instruments
- Other • instruments: smaller drop in WT
- After rain: • sometimes different level of WT than before (i.e. CL31RAO).

Changing WT: reason??





120 100 80 8 optics 60 of State RALPH CHM140101 40 CHX080082 CHXLMU CL51RAO CL51CG CL31RAO CL31RUB 20 15. June. 2015 \cap Ο 5 25 10 15 20 Time [hours]

- Abrupt change at CHX080082
- "Fast" change of CL31RAO
- Slow change of CL31RUB >10%
- Causes uncertainty in the calibration



Window cleaning





120 NAMA ALAN INTI ALAN ITAL ITAL AND A 100 80 8 optics 60 of State RALPH CHM140101 40 CHX080082 CHXLMU CL51RAO CL51CG CL31RAO CL31RUB 20 12. Aug. 2015 5 0 10 15 20 25 Time [hours]

- Abrupt changes in the window transmission
- Some of them has values over 100% → problem of initialization
- All ceilometers cleaned at the same time
- Effect on measurements?



Window cleaning





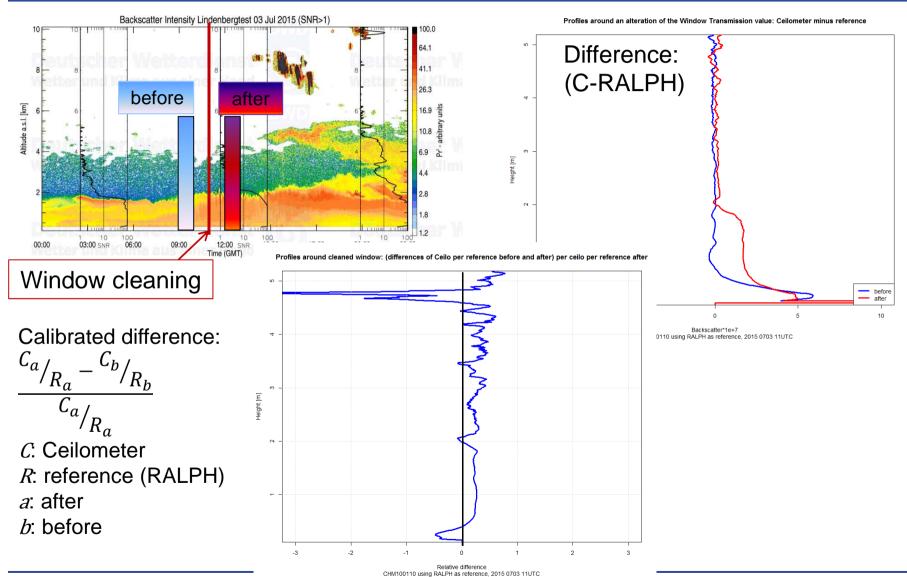
120 TTATE IN MANAGER & 11 100 a, with Way Hill THE REAL PROPERTY OF A THE PROPERTY OF A SUMPLY OF A ¹างการที่การหน้าแห่น เป็นประกาณที่แก่งเหมู่ในแห่งการที่สามารถ ในและที่ไปเก่าการที่สามาร์สามาร์สามาร์สามาร์ได้ได้ไ 80 8 optics 60 of State RALPH CHM140101 40 CHX080082 CHXLMU CL51RAO CL51CG CL31RAO CL31RUB 20 3. July. 2015 0 5 10 15 20 25 Time [hours]

- Abrupt changes
 in the window
 transmission
- Some of them has values over 100% → problem of initialization
- All ceilometers cleaned at the same time
- Effect on measurements?



Window cleaning







8

Changing WT: reason??





120 TINTING TRAT է այս էլ ու էլ անակություններին 80 hill have a optics [%] 60 of State RALPH CHM140 40 CHX080082 CHXLMU CL51RAO CL51CG CL31RAO CL31RUB 20 24. June. 2015 0 5 10 25 15 20 Time [hours]

- CHX080082:
 Abrupt change
- Large variation in the WT value
- Slow and smooth change

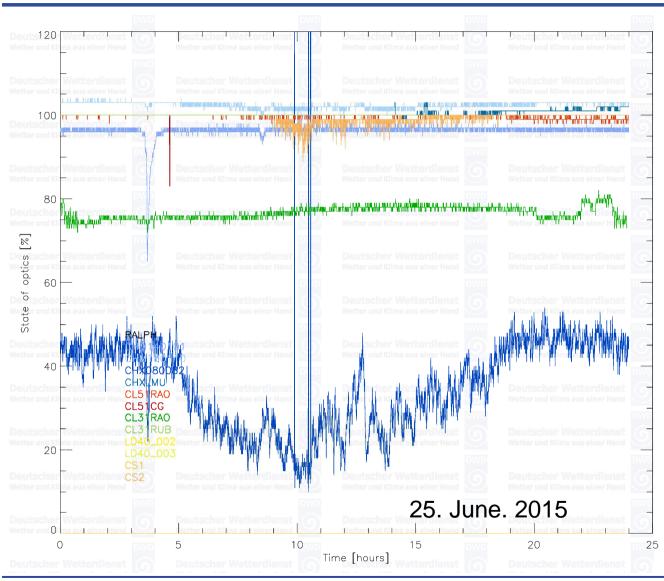
WT dropped from 100% to 15-50%



Changing WT: some partial coverage

•





- CHX080082: Large variation in the WT value
- Slow and smooth change



Changing WT: some partial coverage



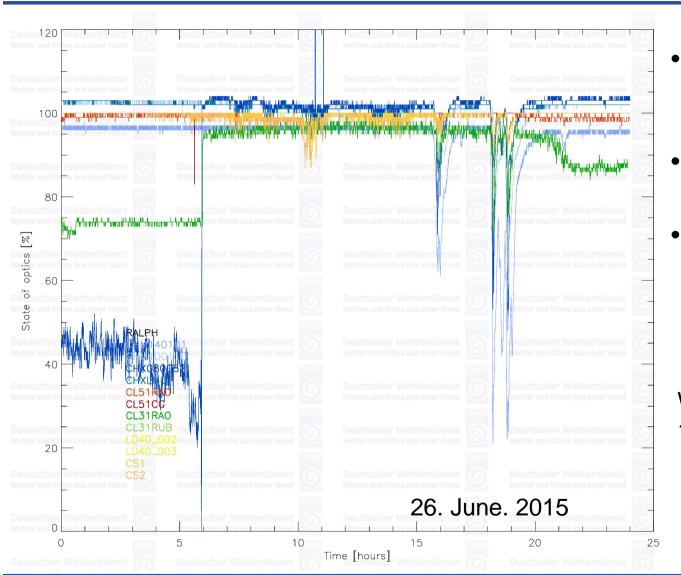
120 100 MUMBER IN A REPORT AND A MADE AND AT THE A SUBART ALAL MARINE WITH A LANSIN 80 , Antomatik in the difference in the second of the second optics [%] 60 State of 20 26. June. 2015 5 0 10 15 20 25 Time [hours]

- CHX080082: Large variation in the WT value
- Slow and smooth change
- Abrupt change: window cleaned



Changing WT: Bird excrement





- CHX080082: Large variation in the WT value
- Slow and smooth change
- Abrupt change: window cleaned

WT dropped from 100% to 15-50%



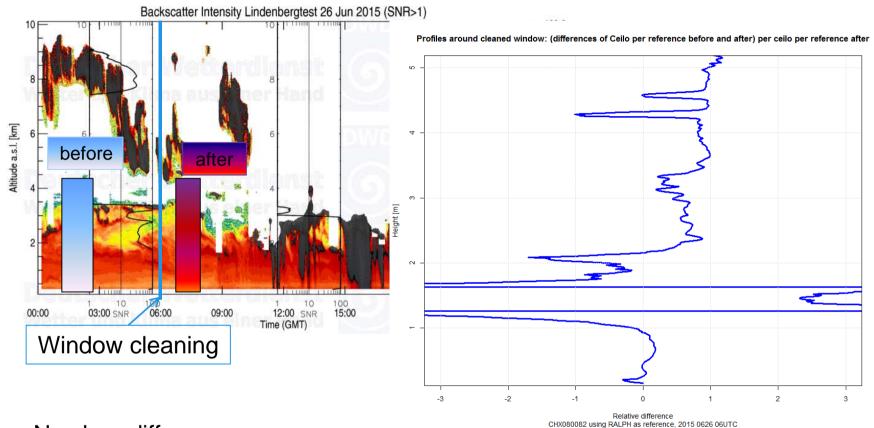
Changing WT: Bird excrement

Deutscher Wetterdienst

DWD

6

Wetter und Klima aus einer Hand



No clear difference:

Probably only a smaller part of the window were covered, and WT sensor was looking exactly there...





- Take an eye on housekeeping data like window transmission (WT)!!! •
- Slow and smooth changes in WT or abrupt changes are possible •
- They may affect the measurements ٠
- Brings uncertainty in the measurements and calibration
- Difference between •
 - partial full coverage (bird poop, leaf, etc.) \rightarrow more random effect \bullet
 - Full window, but transparent coverage (dust, mowed lawn) \rightarrow clearer effect









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