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Modification of a conventional photolytic converter for improving aircraft measurements of NO_2 via chemiluminescence

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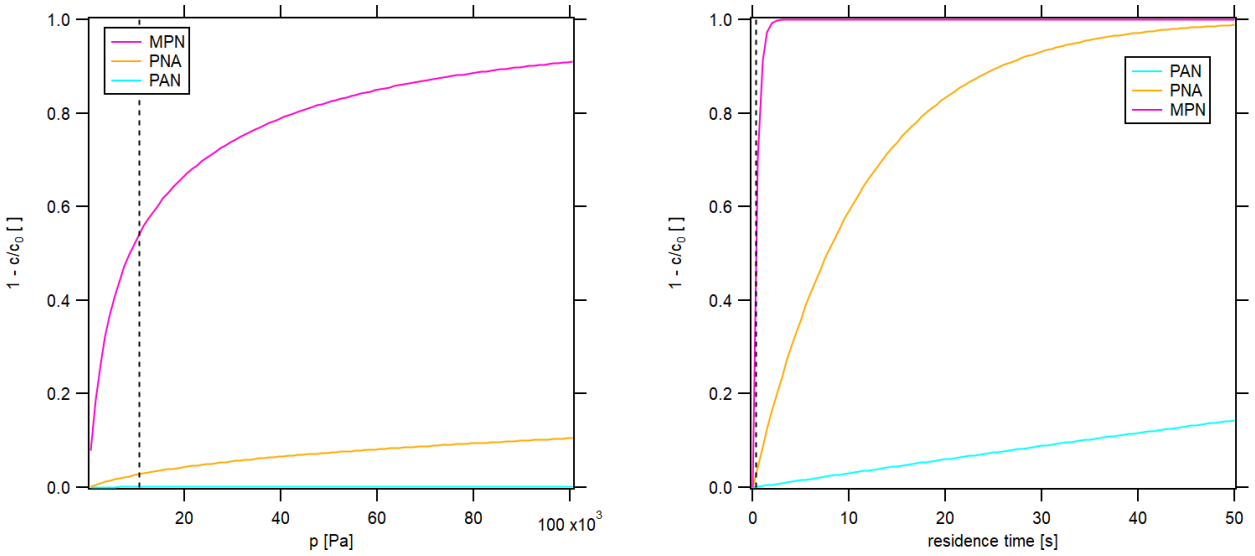


(a) pressure dependent decay

(b) time dependent decay

Figure S1. Decay of NO_2 reservoir species in correlation with (a) the pressure and (b) the residence time in the converter.

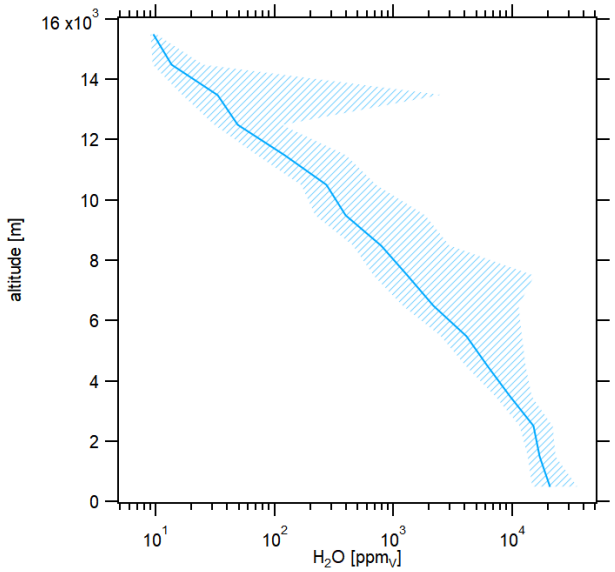
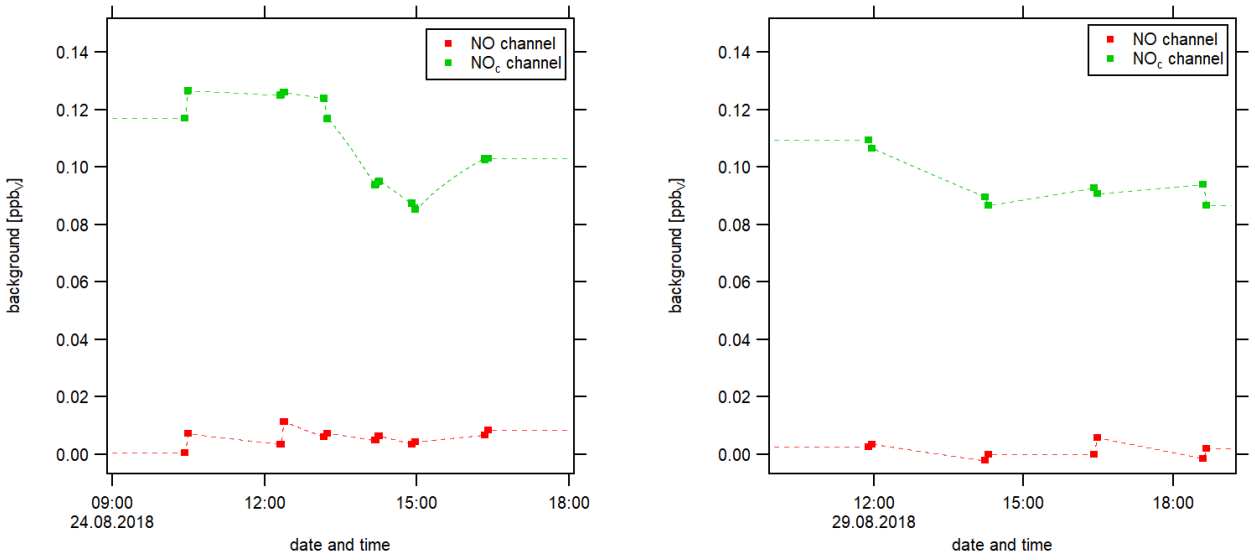


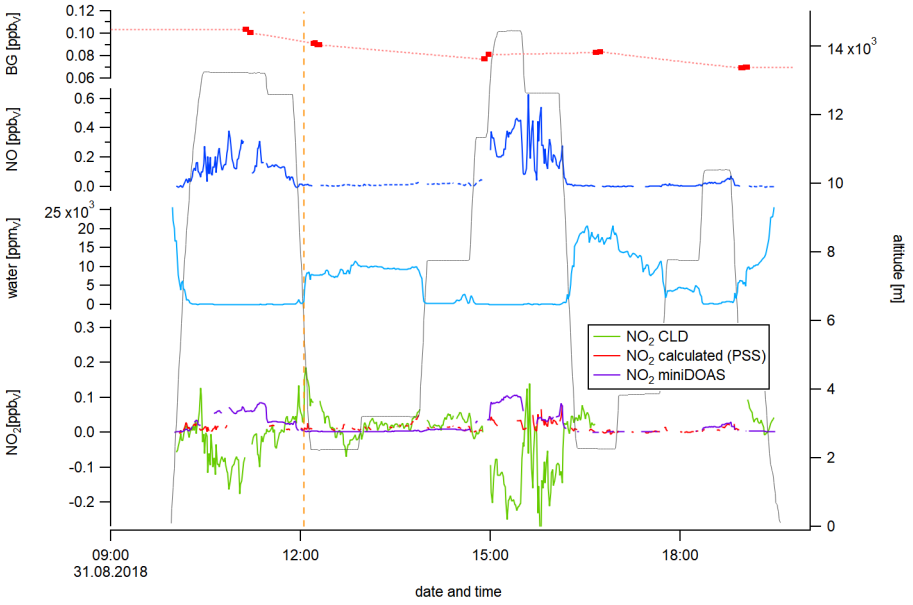
Figure S2. Vertical profile of atmospheric water vapor concentrations.



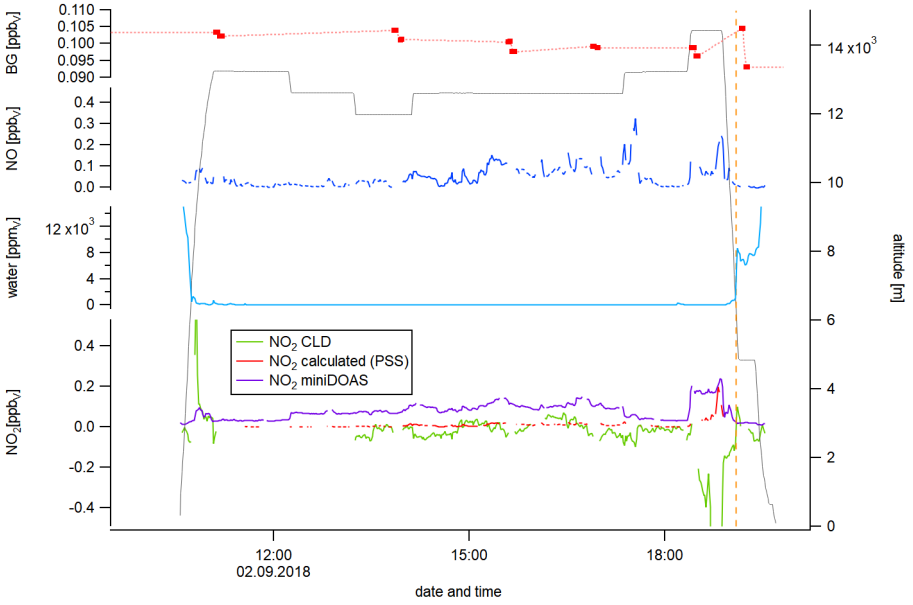
(a) MF10

(b) MF12

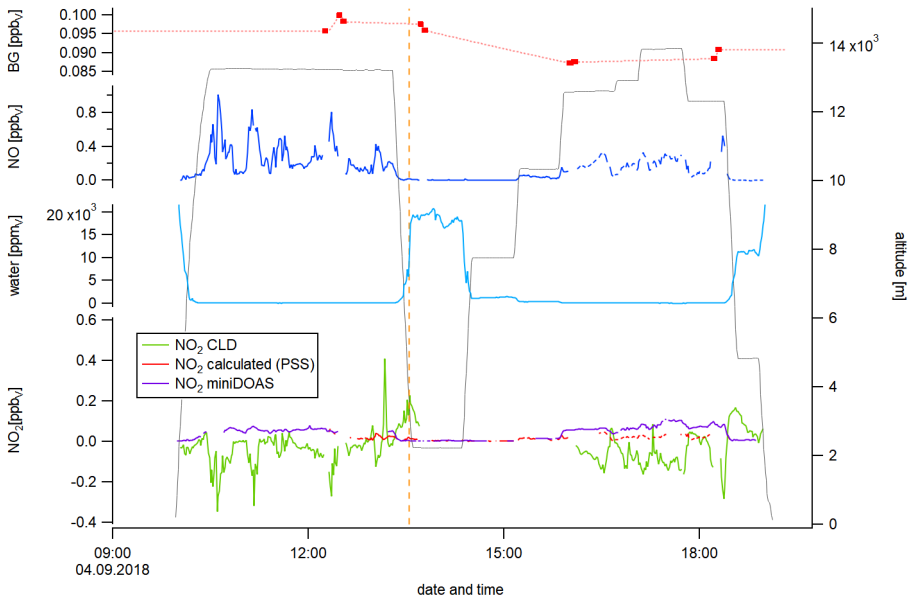
Figure S3. Instrumental background of the NO and the NO_c channel for MF10 and MF12.


BG [ppbv]
NO [ppbv]
water [ppmv]
NO2[ppbv]
altitude [m]
NO2 CLD
NO2 calculated (PSS)
NO2 miniDOAS
09:00
31.08.2018
12:00
15:00
18:00
date and time

(a) MF13

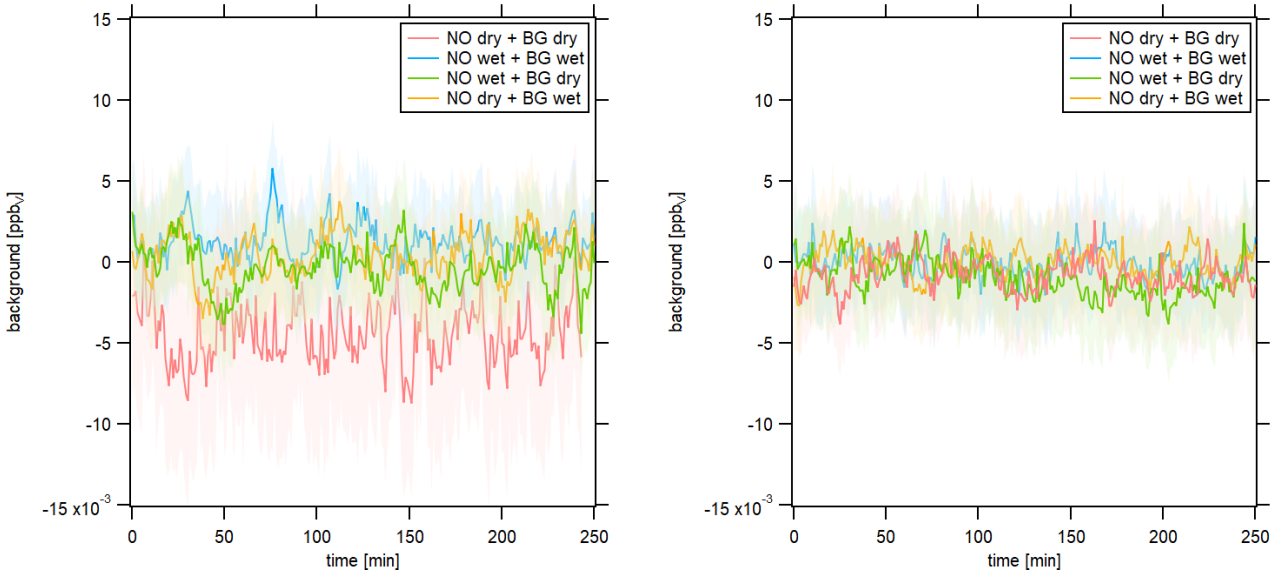

BG [ppbv]
NO [ppbv]
water [ppmv]
NO2[ppbv]
altitude [m]
NO2 CLD
NO2 calculated (PSS)
NO2 miniDOAS
12:00
02.09.2018
15:00
18:00
date and time

(b) MF14



(c) MF15

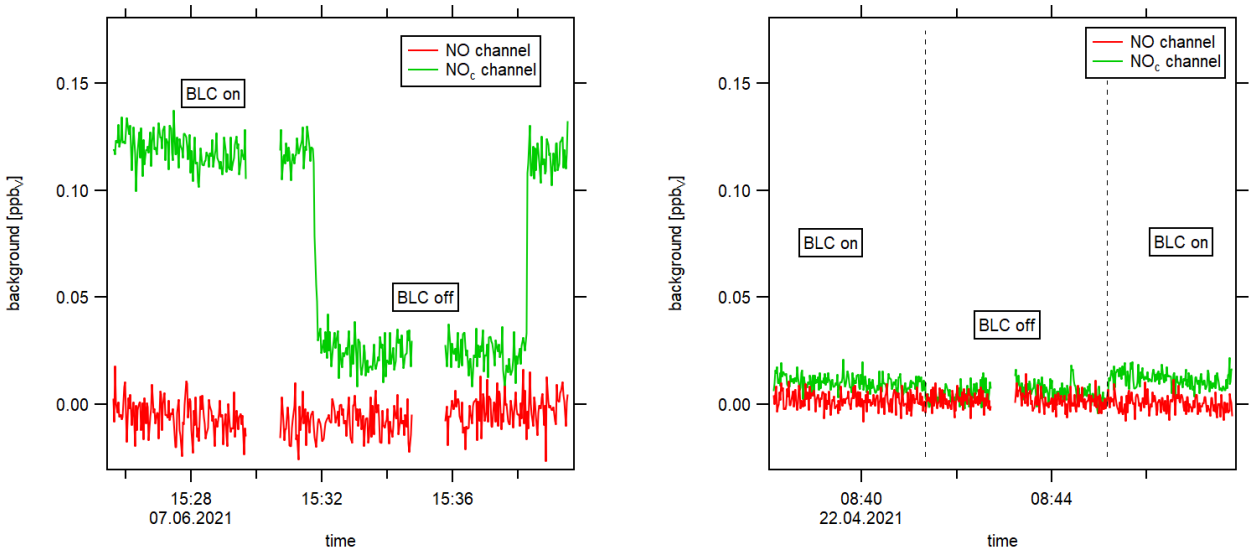
Figure S4. Temporal development of NO, water vapor, and calculated and measured NO_2 exemplarily for measurement flights 13, 14 and 15.



(a) old converter

(b) new converter

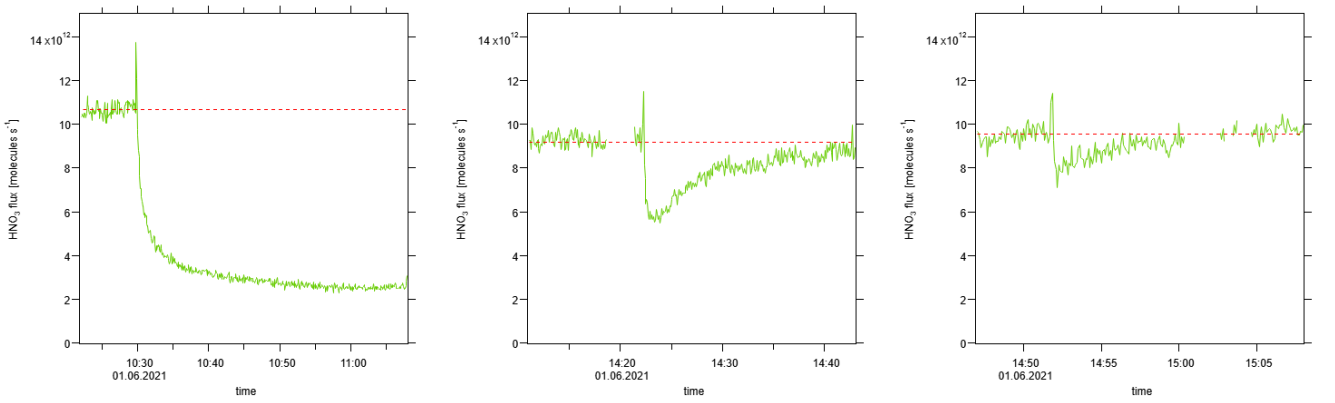
Figure S5. Instrumental background of the first channel in response to dry and humid conditions after 2 h of NO calibration at 15.8 ppbv in analogy to Figure 6 of the manuscript.



(a) type 1 blue light converter

(b) type 2 quartz converter

Figure S6. Instrumental background when switching the LEDs in the photolytic converter on and off during zero air measurement.



(a) type 1 blue light converter

(b) type 2 quartz converter

(c) type 2 quartz converter with FEP coating

Figure S7. HNO_3 uptake experiment.