

Electronic Supplementary Material (ESM)

Critical assessment of meteorological conditions and flow connectivity during HCCT-2010

A. Tilgner¹, L. Schöne¹, P. Bräuer¹, D. van Pinxteren¹, E. Hoffmann¹, W. Birmili¹,
S. Mertes¹, R. Otto¹, M. Merkel¹, K. Weinhold¹, H. Deneke¹, G. Spindler¹,
W. Haunold², A. Engel², A. Wéber², A. Wiedensohler¹, and H. Herrmann¹

[1] Leibniz Institute for Tropospheric Research (TROPOS), Leipzig, Germany

[2] Institute for Atmospheric and Environmental Sciences (IAU), Goethe University Frankfurt, Germany

*Corresponding author: Prof. Dr. Hartmut Herrmann

Phone: +49 341 2717 7023, Fax: +49 341 2717 99 7023, E-mail: herrmann@tropos.de

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Supplementary material on section 2.2: Characterisation of the local flow connectivity using size-segregated aerosol particle number

Particle number size distribution (SMPS)

Particle number size distributions were recorded continuously at all three sites using four identical Scanning Mobility Particle Sizers (SMPS). At each of the upwind and downwind sites, one SMPS was deployed to sample ambient aerosol downstream of a PM₁₀ inlet. At Mt. Schmücke (summit site), which was in cloud during part of the experiment, two SMPS instruments were deployed to measure both interstitial aerosol particles as well as droplet residuals. Here, a counter-flow virtual impactor (CVI) was deployed to separate between interstitial aerosol and cloud droplets. The samples containing cloud droplets were dried downstream of the CVI, thus providing the size distribution of cloud droplet residuals.

All SMPS instruments were configured for a particle diameter range of 10-800 nm at a time resolution of 5 min. The principle of the SMPS instruments deployed during HCCT-2010 follows the set-up and standards described in Wiedensohler et al. (2012). Briefly, all instruments used a Vienna-type differential mobility analyser (Winklmayr et al., 1991) with 28 cm central electrode length. Condensation particle counters (CPC, model 3772, TSI Inc., Shoreview, MN, USA) were used to count particles downstream of the DMAs. The aerosol sample and sheath flow in all SMPS instruments was actively dried, thus ensuring a particle size classification at relative humidity < 20 %. Before and after the experiment, all instruments were compared in the laboratory for at least three days for ambient aerosol. During HCCT-2010, additional CPCs (model 3010, TSI Inc.) were used to measure total particle number concentration. These measurements allowed verification of the total particle number concentration measured by the SMPS instruments. As a result of these quality assurance measures, we estimate the instruments to be comparable within $\pm 10\%$ with respect to particle number concentration at any given diameter.

References:

- Wiedensohler, A., Birmili, W., Nowak, A., Sonntag, A., Weinhold, K., Merkel, M., Wehner, B., Tuch, T., Pfeifer, S., Fiebig, M., Fjaraa, A. M., Asmi, E., Sellegri, K., Depuy, R., Venzac, H., Villani, P., Laj, P., Aalto, P., Ogren, J. A., Swietlicki, E., Williams, P., Roldin, P., Quincey, P., Hüglin, C., Fierz-Schmidhauser, R., Gysel, M., Weingartner, E., Riccobono, F., Santos, S., Gruning, C., Faloon, K., Beddows, D., Harrison, R. M., Monahan, C., Jennings, S. G., O'Dowd, C. D., Marinoni, A., Horn, H. G., Keck, L., Jiang, J., Scheckman, J., McMurry, P. H., Deng, Z., Zhao, C. S., Moerman, M., Henzing, B., de Leeuw, G., Loschau, G., and Bastian, S.: Mobility particle size spectrometers: harmonization of technical standards and data structure to facilitate high quality long-term observations of atmospheric particle number size distributions, *Atmos Meas Tech*, 5, 657-685, 2012.
- Winklmayr, W., Reischl, G. P., Lindner, A. O., and Berner, A.: A new electromobility spectrometer for the measurement of aerosol size distributions in the size range from 1 to 1000 nm, *Journal of Aerosol Science*, 22, 289-296, 1991

Supplementary material on section 3.2: Flow characterisation

Table S1 Overview of the statistical analysis of the connected flow and non-cloud conditions. Mean COD values, wind direction and speed at Mt. Schmücke (dd, ff), precipitation (RR) are presented for the selected NCEs.

NCE	dd SM deg	ff SM m s ⁻¹	COD SM-GL O ₃	COD GB-SM O ₃	COD GB-GL O ₃	COD SM-GL N49nm	COD GB-SM N49nm	COD GB-GL N49nm	COD SM-GL N217nm	COD GB-SM N217nm	COD GB-GL N217nm	RR SM mm
NCE0.1	233	7.4	0.03	0.04	0.02	0.06	0.08	0.03	0.05	-16.59	-16.59	0.0
NCE0.2	243	8.5	0.01	0.02	0.02	0.04	0.08	0.07	0.04	0.04	0.05	0.0
NCE0.3	239	4.7	0.07	0.05	0.05	0.04	0.07	0.08	0.05	0.11	0.09	0.0
NCE0.4	234	8.0	0.07	0.04	0.04	0.06	0.05	0.07	0.04	0.08	0.08	0.0
NCE0.5	217	2.9	0.10	0.08	0.05	0.08	0.13	0.16	0.07	0.06	0.08	0.0
NCE0.6	210	6.6	0.11	0.09	0.03	0.04	0.03	0.05	0.06	0.04	0.03	0.0
NCE0.7	221	6.6	0.07	0.06	0.03	0.09	0.07	0.13	0.06	0.04	0.03	0.0
NCE0.8	217	5.0	0.08	0.07	0.04	0.13	0.06	0.16	0.11	0.04	0.11	0.0
NCE0.9	246	6.1	0.07	0.04	0.06	0.09	0.05	0.13	0.10	0.06	0.08	0.0
NCE0.10	228	11.4	0.06	0.04	0.03	0.15	0.03	0.15	0.06	0.03	0.05	0.0
NE_NCE												
NE_NCE0.1	49	1.3	0.08	0.09	0.06	0.11	0.14	0.14	0.06	0.08	0.07	0.0
NE_NCE0.2	60	2.2	0.11	0.10	0.06	0.05	0.06	0.09	0.04	0.06	0.05	0.0
NE_NCE0.3	69	4.7	0.03	0.12	0.09	0.06	0.12	0.12	0.05	0.11	0.09	0.0
NE_NCE0.4	51	5.7	0.02	0.12	0.10	0.05	0.13	0.11	0.04	0.13	0.11	0.0
NE_NCE0.5	52	5.7	0.03	0.11	0.09	0.06	0.08	0.09	0.04	0.07	0.06	0.0
Remarks: NCE0.1: 15.09.10 12:10 - 15.09.10 22:10 NCE0.2: 16.09.10 02:50 - 16.09.10 06:10 NCE0.3: 19.09.10 11:20 - 19.09.10 17:00 NCE0.4: 20.09.10 11:50 - 20.09.10 16:20 NCE0.5: 22.09.10 1:50 - 22.09.10 16:00 NCE0.6: 23.09.10 23:30 - 24.09.10 02:50 NCE0.7: 24.09.10 10:30 - 24.09.10 20:00 NCE0.8: 03.10.10 11:20 - 03.10.10 14:40 NCE0.9: 21.10.10 12:40 - 21.10.10 21:20 NCE0.10: 23.10.10 16:10 - 23.10.10 22:40 NE_NCE0.1: 07.10.10 13:00 - 07.10.10 18:50 NE_NCE0.2: 08.10.10 15:10 - 08.10.10 18:30 NE_NCE0.3: 09.10.10 14:30 - 10.10.10 09:30 NE_NCE0.4: 10.10.10 15:50 - 11.10.10 03:30 NE_NCE0.5: 11.10.10 13:00 - 12.09.10 04:30 (CEST)												

Supplementary material on section 3.4: Tracer experiments

Table S2 Locations of release and sampling sites during SF₆ tracer experiments.

Site ID	Location	Height amsl	Geographic coordinates
<i>SF6 release</i>			
10	Goldlauter upwind site	605 m	10°45'14" E 50°38'15" N
<i>SF6 sampling</i>			
20a	Mt. Schmücke tower	957 m	10°46'10" E 50°39'18" N
20b	Mt. Schmücke ground	937 m	10°46'10" E 50°39'18" N
21	Adler (Mühltiegel)	930 m	10°45'16" E 50°39'10" N
22	Borsten Platz	880 m	10°46'23" E 50°38'46" N
41	Jägerstein	963 m	10°45'59" E 50°39'38" N
42	Seiffartsburg	900 m	10°46'58" E 50°39'25" N
40	Göldene Brücke	865 m	10°46'42" E 50°39'53" N
32	Gehlberg downwind	738 m	10°47'32" E 50°40'21" N
30	Am Brand	718 m	10°46'58" E 50°40'37" N

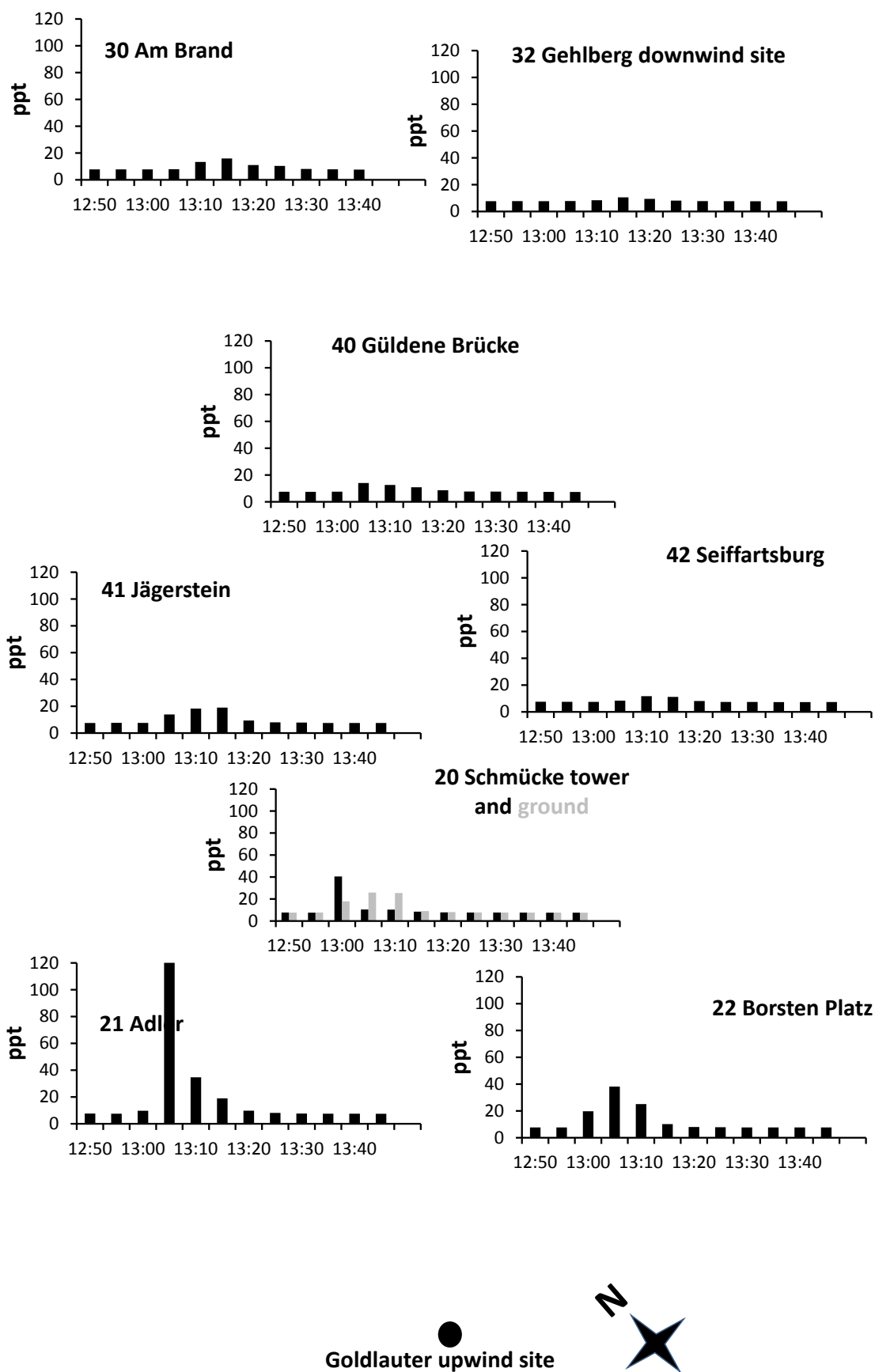


Fig. S1 SF_6 time series at different sites during tracer experiment 2 (23-09-2013). Air flow not connected.

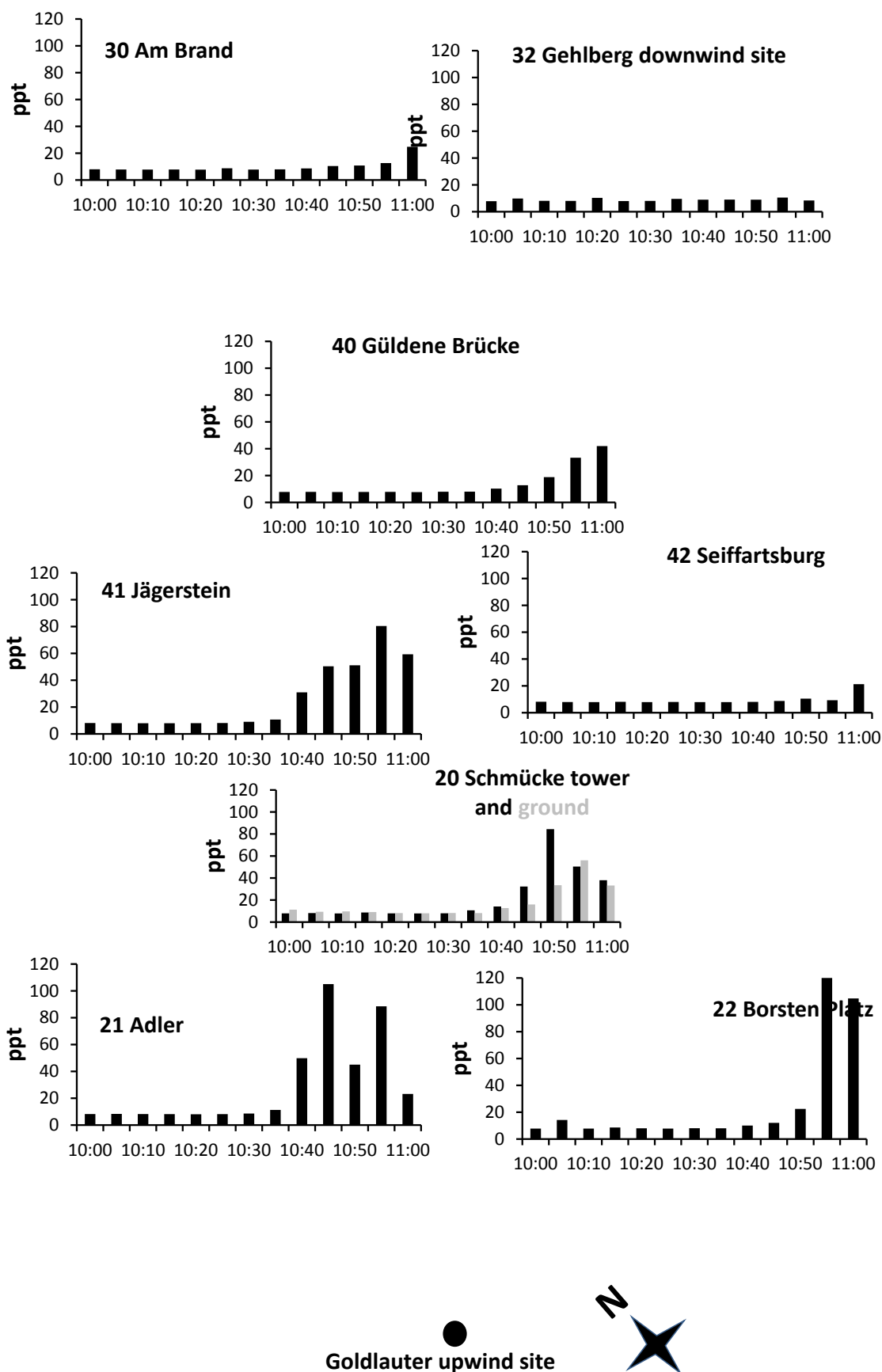


Fig. S2 SF_6 time series at different sites during tracer experiment 4 (23-10-2013). Air flow not connected.

Supplementary Figures and data for the investigated FCEs

A: FCE1.1 (14-15).09.10 11:00 – 01:50 (CEST) (offline sampling 11:00 – 02:00 CEST)

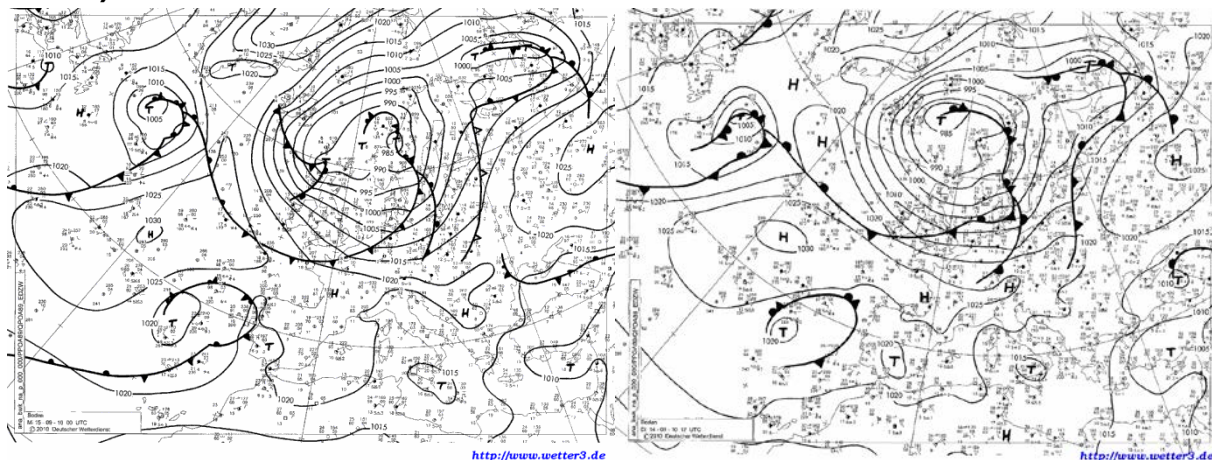


Fig. A 1 Surface weather charts on 14-09-2010, 12 UTC and on 15-09-2010, 00 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

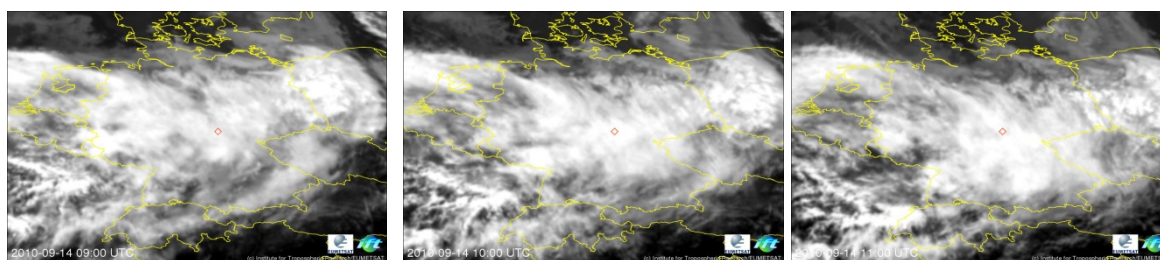


Fig. A 2 IR-satellite picture on 14-09-2010, 09, 10 and 11 UTC (source: ©TROPPOS/EUMETSAT).

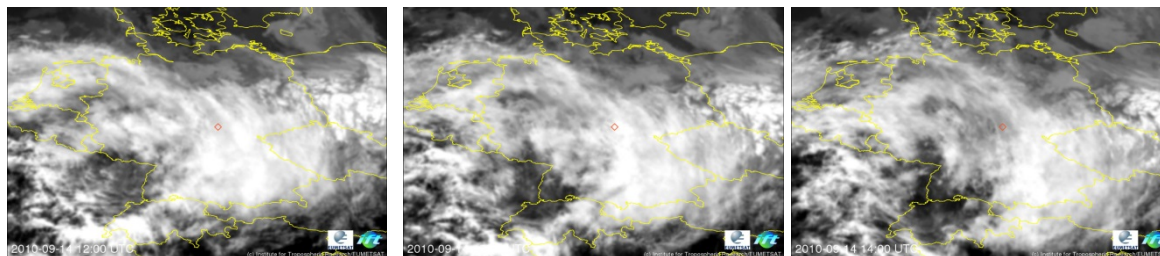


Fig. A 3 IR-satellite picture on 14-09-2010, 12, 13 and 14 UTC (source: ©TROPPOS/EUMETSAT).

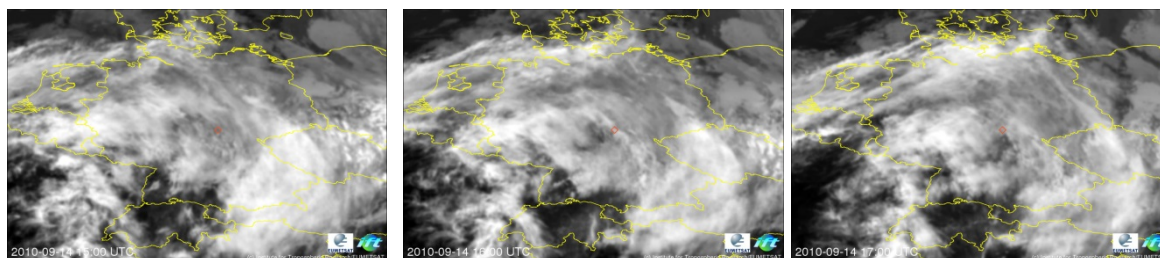


Fig. A 4 IR-satellite picture on 14-09-2010, 15, 16 and 17 UTC (source: ©TROPPOS/EUMETSAT).

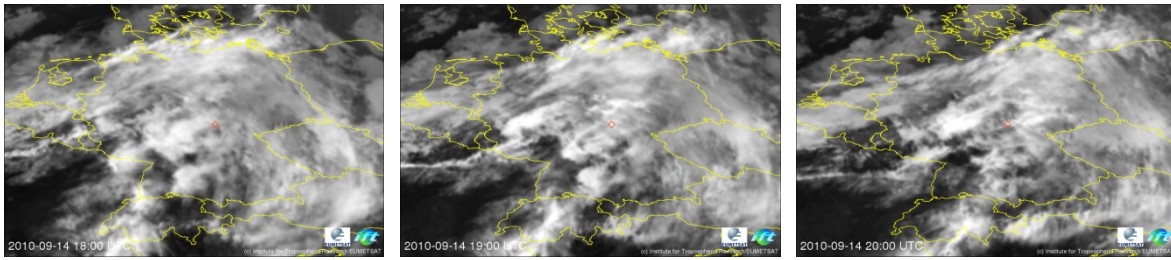


Fig. A 5 IR-satellite picture on 14-09-2010, 18, 19 and 20 UTC (source: ©TROPOS/EUMETSAT).

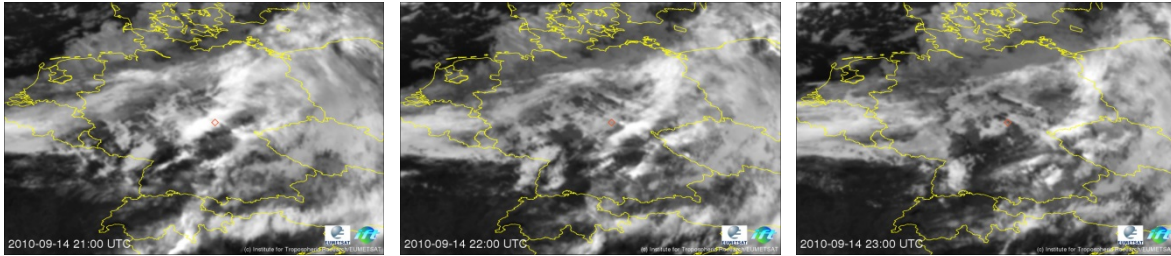


Fig. A 6 IR-satellite picture on 14-09-2010, 21, 22 and 23 UTC (source: ©TROPOS/EUMETSAT).

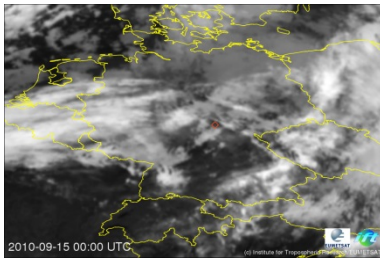


Fig. A 7 IR-satellite picture on 15-09-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

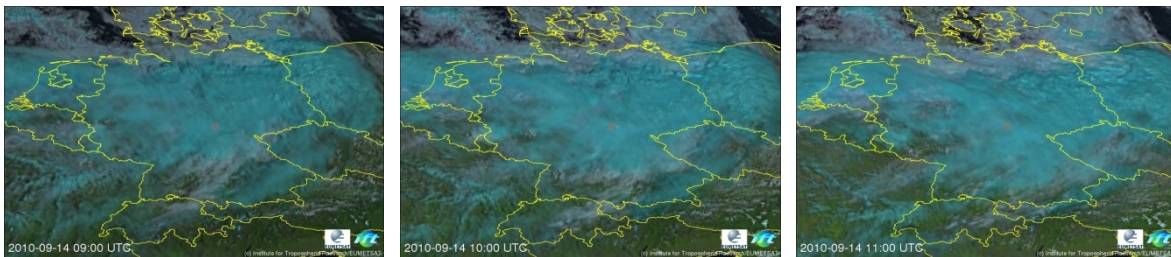


Fig. A 8 VIS-satellite picture on 14-09-2010, 09, 10 and 11 UTC (source: ©TROPOS/EUMETSAT).

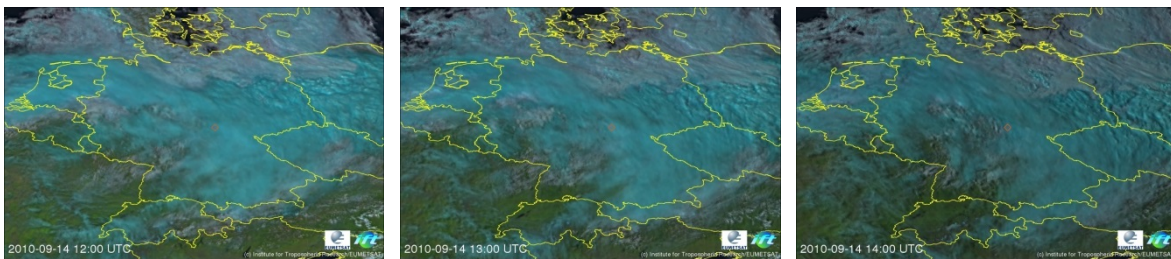


Fig. A 9 VIS-satellite picture on 14-09-2010, 12, 13 and 14 UTC (source: ©TROPOS/EUMETSAT).



Fig. A 10 VIS-satellite picture on 14-09-2010, 15, 16 and 17 UTC (source: ©TROPOS/EUMETSAT).

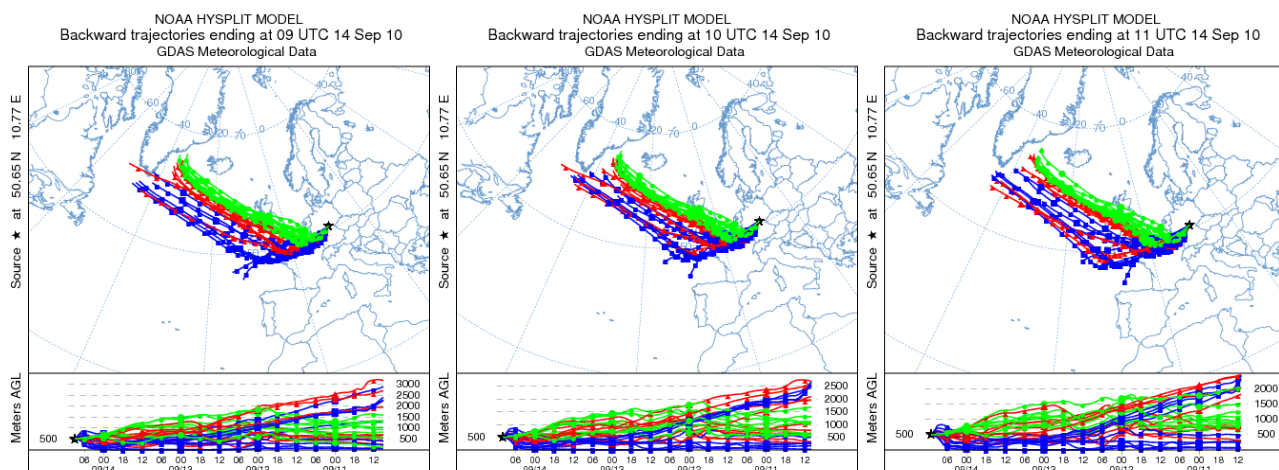


Fig. A 11 Backward trajectories on 14-09-2010, 09, 10 and 11 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

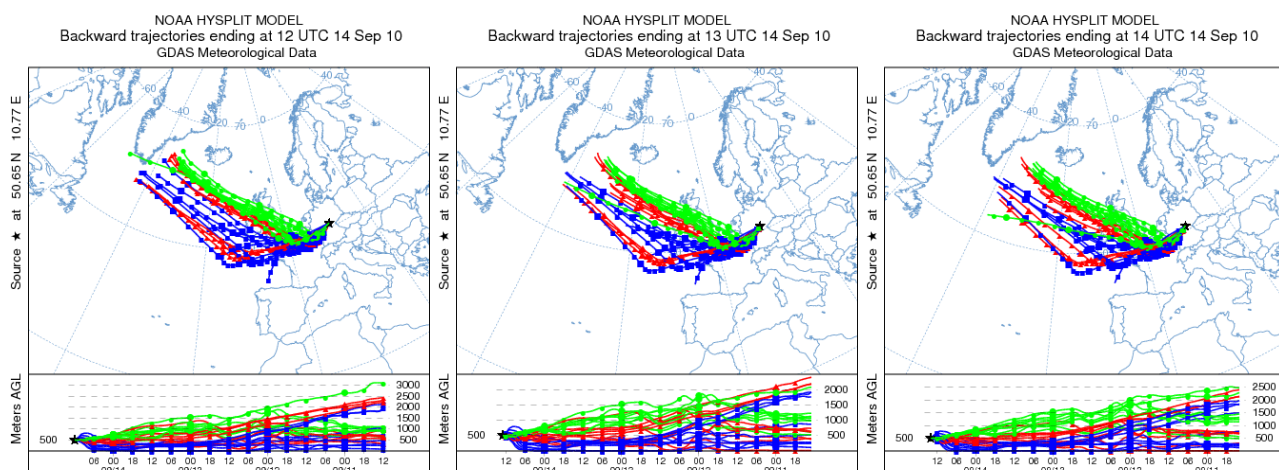


Fig. A 12 Backward trajectories on 14-09-2010, 12, 13 and 14 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

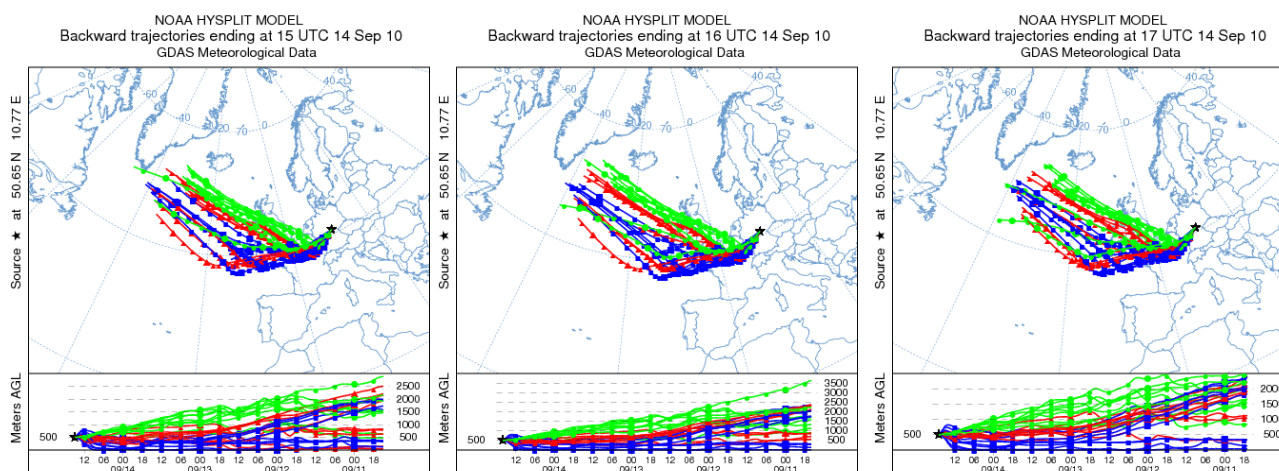


Fig. A 13 Backward trajectories on 14-09-2010, 15, 16 and 17 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

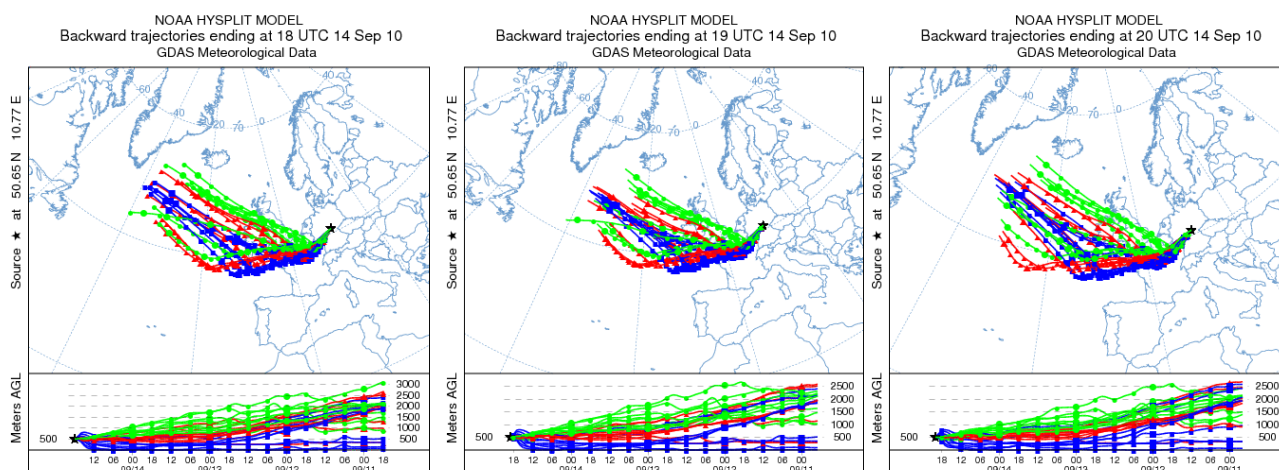


Fig. A 14 Backward trajectories on 14-09-2010, 18, 19 and 20 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

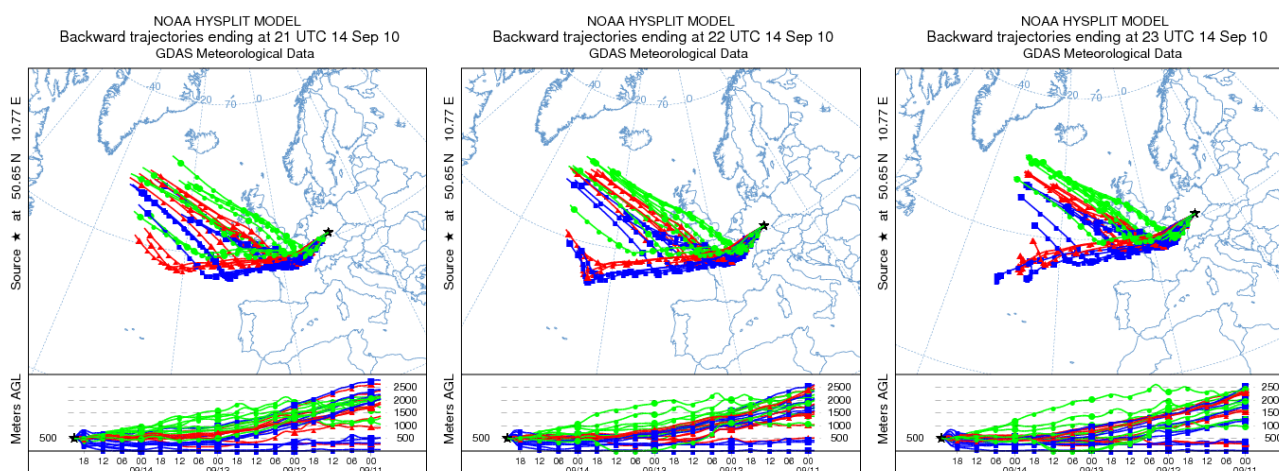


Fig. A 15 Backward trajectories on 14-09-2010, 21, 22 and 23 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

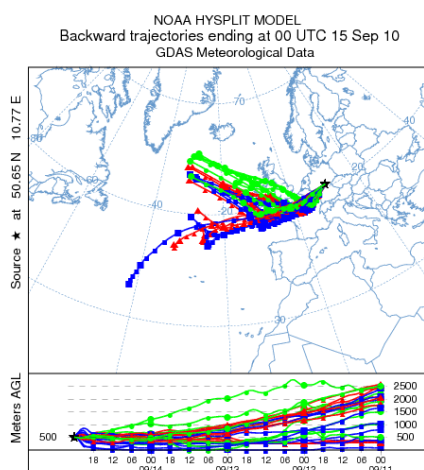


Fig. A 16 Backward trajectories on 15-09-2010, 00 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

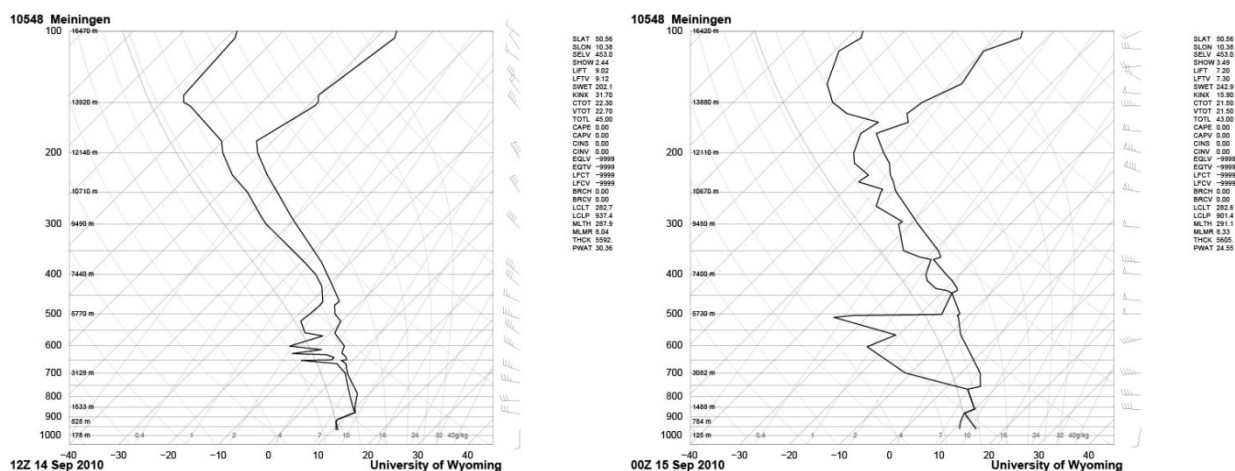


Fig. A 17 Vertical rawinsonde profiles of temperature and dew-point temperature on 14-09-2010, 12 UTC and on 15-09-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table A 1 Locally measured meteorological data at the summit station Schmücke on 14/15-09-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
14-09-2010 11:00	7.3	909.9	0.0	9.6	232.0
14-09-2010 11:10	7.3	909.9	0.0	8.5	233.5
14-09-2010 11:20	7.3	909.9	0.0	7.9	236.0
14-09-2010 11:30	7.3	909.7	0.0	8.6	235.0
14-09-2010 11:40	7.4	909.6	0.0	8.6	237.3
14-09-2010 11:50	7.4	910.0	0.2	7.8	228.5
14-09-2010 12:00	7.4	909.7	0.2	8.1	238.5
14-09-2010 12:10	7.5	909.4	0.0	8.7	234.1
14-09-2010 12:20	7.6	909.2	0.0	7.9	231.9
14-09-2010 12:30	7.6	909.2	0.0	7.2	239.7
14-09-2010 12:40	7.7	909.2	0.0	8.0	241.5
14-09-2010 12:50	7.8	909.3	0.0	7.8	235.2
14-09-2010 13:00	7.8	909.2	0.0	8.2	225.8
14-09-2010 13:10	7.8	909.1	0.0	8.1	232.9
14-09-2010 13:20	7.9	909.1	0.0	9.0	220.1
14-09-2010 13:30	8.0	909.0	0.0	8.4	230.5
14-09-2010 13:40	8.1	908.9	0.0	8.2	244.7
14-09-2010 13:50	8.1	908.8	0.0	7.3	232.5
14-09-2010 14:00	8.2	908.7	0.0	7.5	241.6
14-09-2010 14:10	8.2	908.7	0.0	7.3	235.9
14-09-2010 14:20	8.2	908.5	0.0	7.6	243.6
14-09-2010 14:30	8.3	908.5	0.0	8.2	232.3
14-09-2010 14:40	8.4	908.5	0.0	7.9	241.0
14-09-2010 14:50	8.5	908.4	0.0	8.2	236.8
14-09-2010 15:00	8.5	908.2	0.0	8.1	235.2
14-09-2010 15:10	8.6	908.1	0.0	8.2	242.7
14-09-2010 15:20	8.7	908.0	0.0	9.0	237.8
14-09-2010 15:30	8.7	908.0	0.0	8.5	241.1
14-09-2010 15:40	8.8	908.0	0.0	8.8	242.4
14-09-2010 15:50	8.8	908.0	0.0	8.8	235.4

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
14-09-2010 16:00	8.9	907.9	0.0	8.8	241.2
14-09-2010 16:10	8.9	907.9	0.0	8.9	238.5
14-09-2010 16:20	9.0	907.8	0.0	8.8	239.2
14-09-2010 16:30	9.1	907.6	0.0	9.1	239.9
14-09-2010 16:40	9.2	907.5	0.0	9.2	240.8
14-09-2010 16:50	9.3	907.5	0.0	9.0	235.1
14-09-2010 17:00	9.4	907.5	0.0	7.8	243.4
14-09-2010 17:10	9.5	907.5	0.0	7.9	233.7
14-09-2010 17:20	9.6	907.5	0.0	8.9	237.5
14-09-2010 17:30	9.7	907.3	0.0	8.2	238.2
14-09-2010 17:40	9.7	907.2	0.0	8.7	241.0
14-09-2010 17:50	9.7	907.4	0.0	8.3	235.5
14-09-2010 18:00	9.8	907.2	0.0	8.9	233.1
14-09-2010 18:10	9.8	907.1	0.0	8.9	236.5
14-09-2010 18:20	9.9	906.9	0.0	7.9	242.9
14-09-2010 18:30	9.9	906.9	0.0	8.3	239.5
14-09-2010 18:40	10.1	906.9	0.0	9.2	238.9
14-09-2010 18:50	10.1	906.8	0.0	8.6	231.7
14-09-2010 19:00	10.1	906.9	0.0	7.8	235.5
14-09-2010 19:10	10.1	906.9	0.2	7.7	233.5
14-09-2010 19:20	10.1	906.7	0.0	8.0	227.5
14-09-2010 19:30	10.1	906.6	0.0	8.1	226.2
14-09-2010 19:40	10.1	906.6	0.0	8.0	227.1
14-09-2010 19:50	10.1	906.4	0.0	8.4	229.1
14-09-2010 20:00	10.1	906.4	0.0	8.1	228.5
14-09-2010 20:10	10.1	906.4	0.0	8.4	241.3
14-09-2010 20:20	10.1	906.1	0.0	8.0	241.6
14-09-2010 20:30	10.1	906.2	0.0	8.2	245.7
14-09-2010 20:40	10.1	906.3	0.0	7.7	243.2
14-09-2010 20:50	10.1	906.1	0.0	7.5	240.5
14-09-2010 21:00	10.1	906.2	0.0	7.6	243.7
14-09-2010 21:10	10.1	906.2	0.0	7.2	243.8
14-09-2010 21:20	10.1	905.9	0.0	7.9	236.7
14-09-2010 21:30	10.1	905.9	0.0	8.1	247.8
14-09-2010 21:40	10.1	905.9	0.0	8.7	236.2
14-09-2010 21:50	10.1	905.8	0.0	9.1	233.5
14-09-2010 22:00	10.1	905.8	0.0	8.5	242.5
14-09-2010 22:10	10.1	905.8	0.0	8.5	232.5
14-09-2010 22:20	10.1	905.6	0.0	8.3	233.5
14-09-2010 22:30	10.1	905.7	0.0	7.8	229.4
14-09-2010 22:40	10.1	905.8	0.0	7.9	236.5
14-09-2010 22:50	9.9	905.4	0.0	7.1	234.1
14-09-2010 23:00	9.9	905.4	0.0	8.0	240.7
14-09-2010 23:10	9.9	905.4	0.0	8.3	233.6
14-09-2010 23:20	9.9	905.3	0.0	8.5	243.0

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
14-09-2010 23:30	9.9	905.4	0.0	7.4	242.7
14-09-2010 23:40	9.8	905.4	0.0	7.7	243.3
14-09-2010 23:50	9.8	905.3	0.2	8.7	239.9
15-09-2010 00:00	9.7	905.1	0.2	8.4	226.7
15-09-2010 00:10	9.7	904.9	0.0	8.5	234.5
15-09-2010 00:20	9.7	904.7	0.0	8.3	227.8
15-09-2010 00:30	9.7	904.6	0.0	8.3	229.5
15-09-2010 00:40	9.7	904.6	0.2	7.4	222.7
15-09-2010 00:50	9.6	904.3	0.0	8.1	221.8
15-09-2010 01:00	9.6	904.2	0.0	7.9	224.4
15-09-2010 01:10	9.6	904.2	0.0	7.5	223.2
15-09-2010 01:20	9.5	903.9	0.0	7.9	227.5
15-09-2010 01:30	9.5	903.8	0.0	8.0	233.0
15-09-2010 01:40	9.5	903.7	0.0	7.7	236.0
15-09-2010 01:50	9.5	903.4	0.0	8.4	232.7
15-09-2010 02:00	9.4	903.4	0.0	8.5	214.4

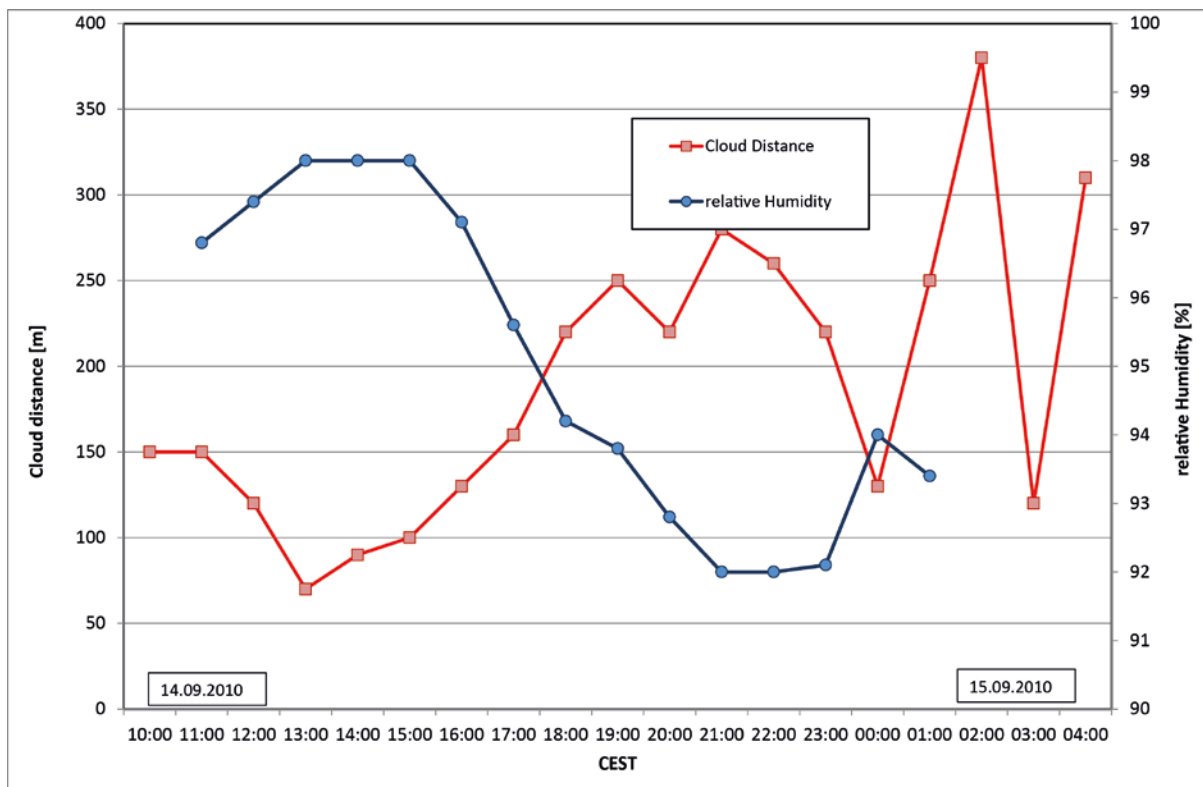


Fig. A 18 Cloud height and relative humidity on cloud event FCE1.1.

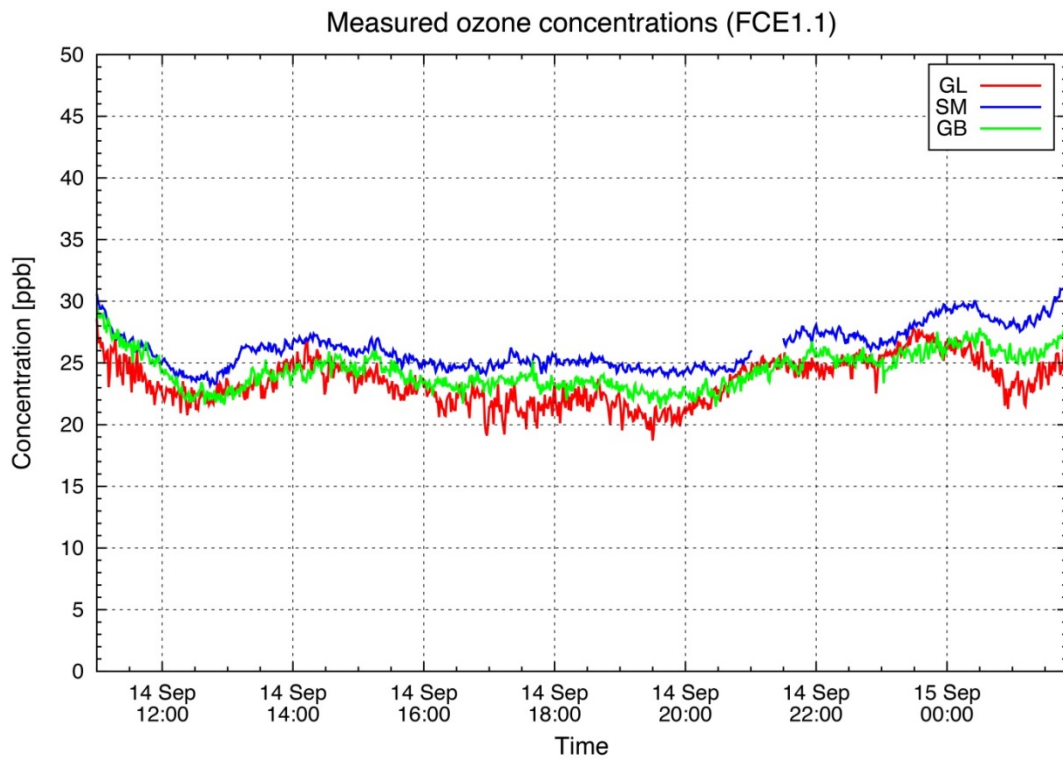


Fig. A 19 Measured ozone concentration over the full event.

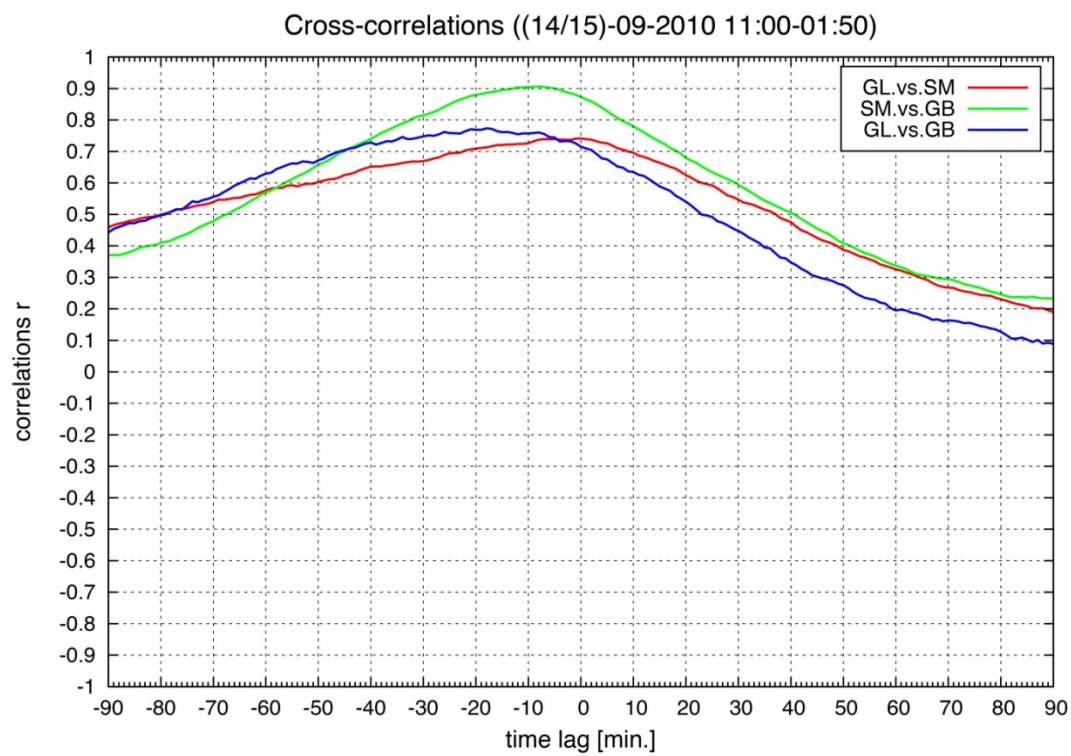


Fig. A 20 Cross-correlation of the full event.

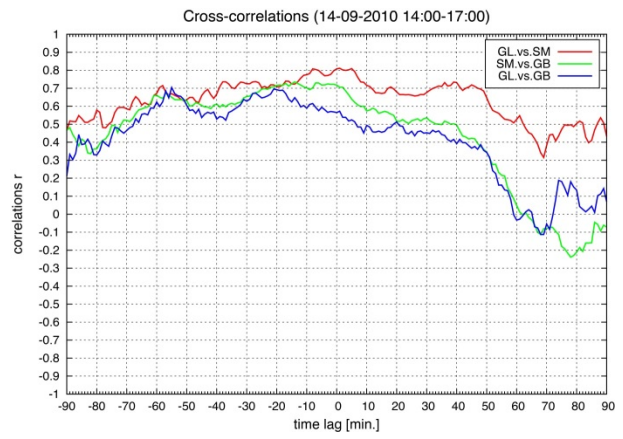
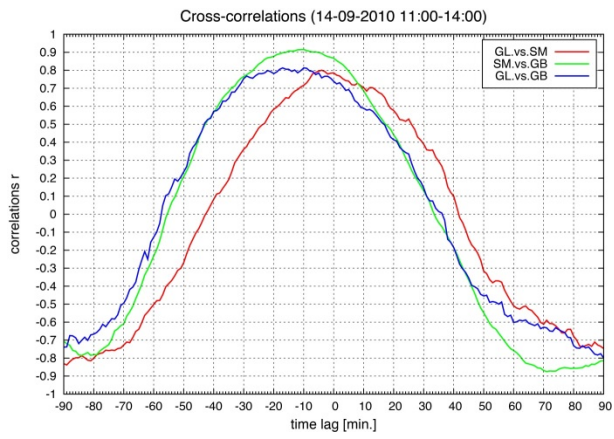


Fig. A 21 Cross-correlation on 14-09-2010, 11 - 14 CEST and 14 - 17 CEST.

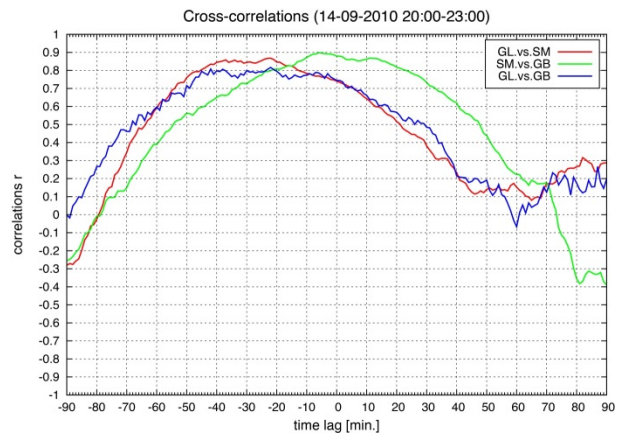
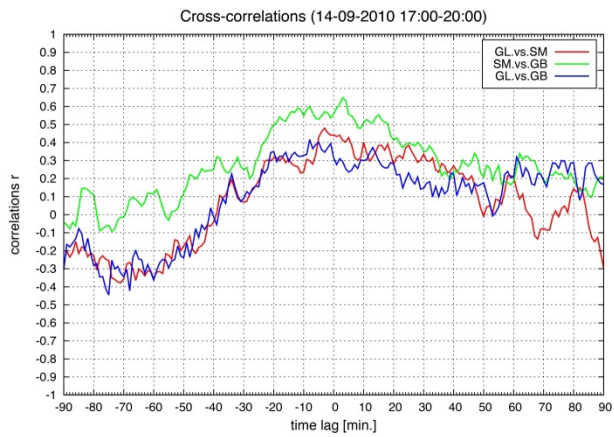


Fig. A 22 Cross-correlation on 14-09-2010, 17 - 20 CEST and 20 - 23 CEST.

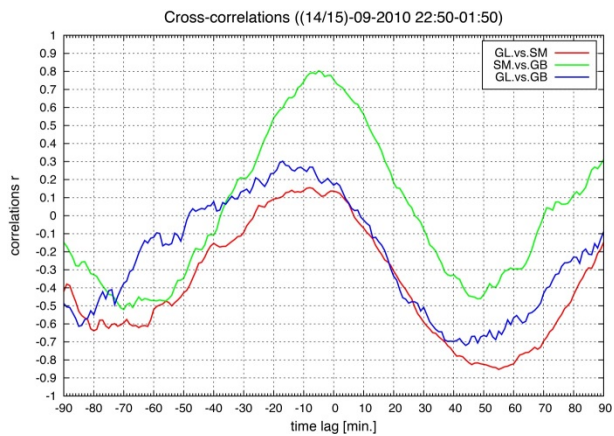


Fig. A 23 Cross-correlation on 14 and 15-09-2010, 22:50 - 01:50 CEST.

B: FCE1.2 15.09.10 03:00 – 06:20 (CEST)

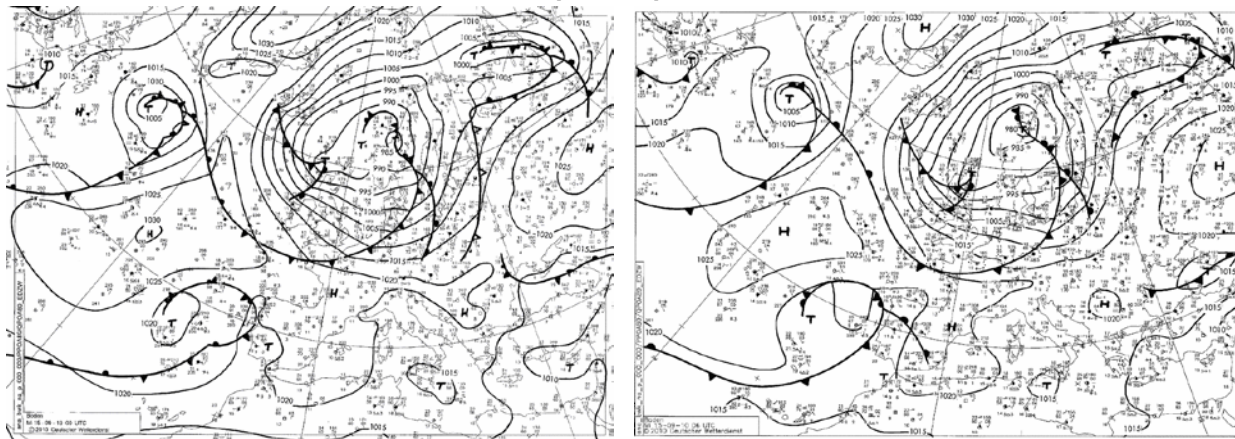


Fig. B 1 Surface weather charts on 15-09-2010, 00 UTC and 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

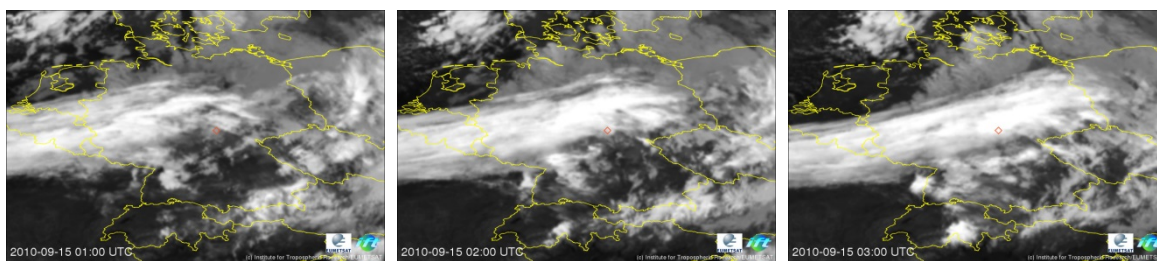


Fig. B 2 IR-satellite picture on 15-09-2010, 01, 02 and 03 UTC (source: ©TROPOS/EUMETSAT).

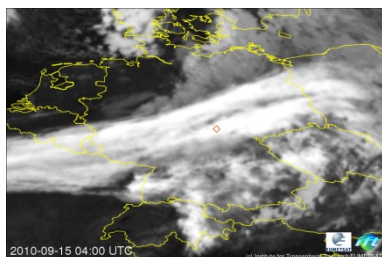


Fig. B 3 IR-satellite picture on 15-09-2010, 04 UTC (source: ©TROPOS/EUMETSAT).

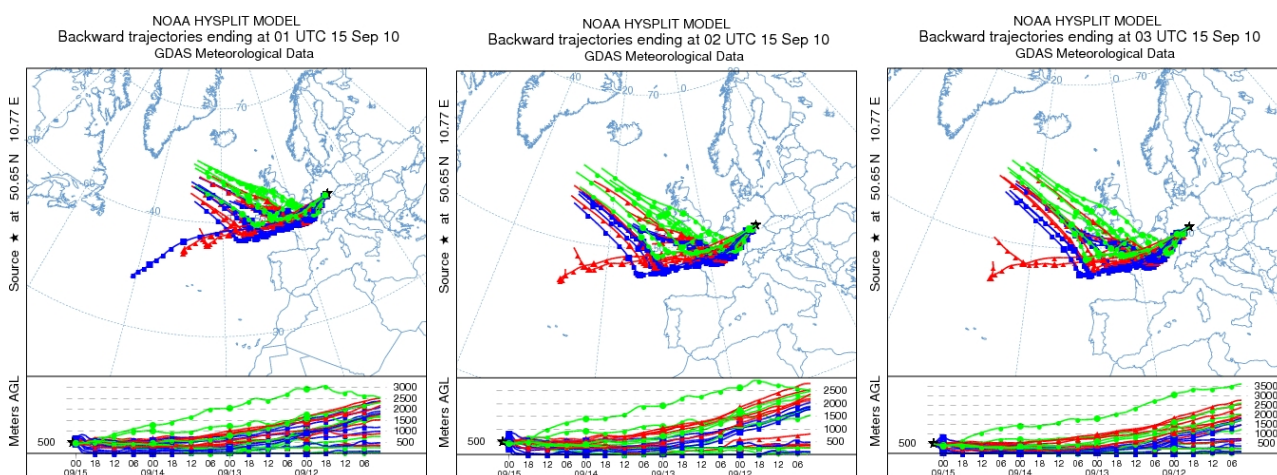


Fig. B 4 Backward trajectories on 15-09-2010, 01, 02 and 03 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

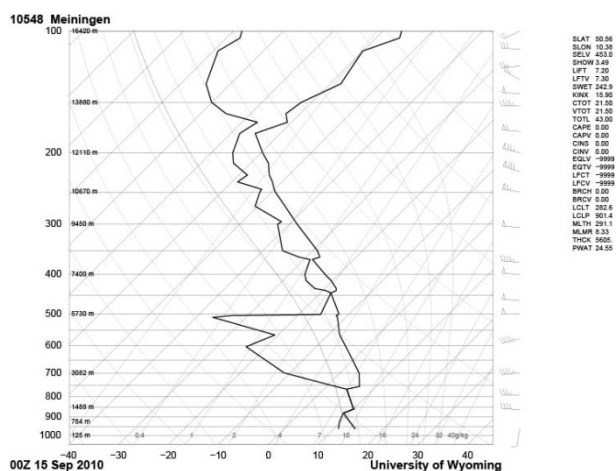


Fig. B 5 Vertical rawinsonde profiles of temperature and dew-point temperature on 15-09-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table B 1 Locally measured meteorological data at the summit station Schmücke on 15-09-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
15-09-201003:00	9.2	902.3	0.0	7.6	
15-09-201003:10	9.2	902.3	0.0	8.7	235.0
15-09-201003:20	9.2	901.9	0.0	8.9	226.4
15-09-201003:30	9.2	901.8	0.2	8.8	230.6
15-09-201003:40	9.2	901.7	0.0	8.3	229.1
15-09-201003:50	9.2	901.4	0.2	8.8	217.4
15-09-201004:00	9.2	901.3	0.0	9.3	231.7
15-09-201004:10	9.1	901.2	0.0	9.4	231.0
15-09-201004:20	9.1	901.1	0.0	9.5	232.8
15-09-201004:30	9.1	900.9	0.0	9.3	230.6
15-09-201004:40	9.1	900.7	0.0	9.5	238.9
15-09-201004:50	9.2	900.6	0.0	9.6	230.7
15-09-201005:00	9.2	900.4	0.0	9.9	230.5
15-09-201005:10	9.2	900.2	0.0	10.0	237.7
15-09-201005:20	9.2	899.8	0.0	9.9	236.5
15-09-201005:30	9.2	899.7	0.0	10.4	240.5
15-09-201005:40	9.2	899.7	0.0	9.8	236.6
15-09-201005:50	9.2	899.3	0.0	10.7	220.5
15-09-201006:00	9.2	899.2	0.0	10.9	223.6
15-09-201006:10	9.2	899.2	0.0	10.6	234.4
15-09-201006:20	9.2	899.3	0.0	10.9	232.3

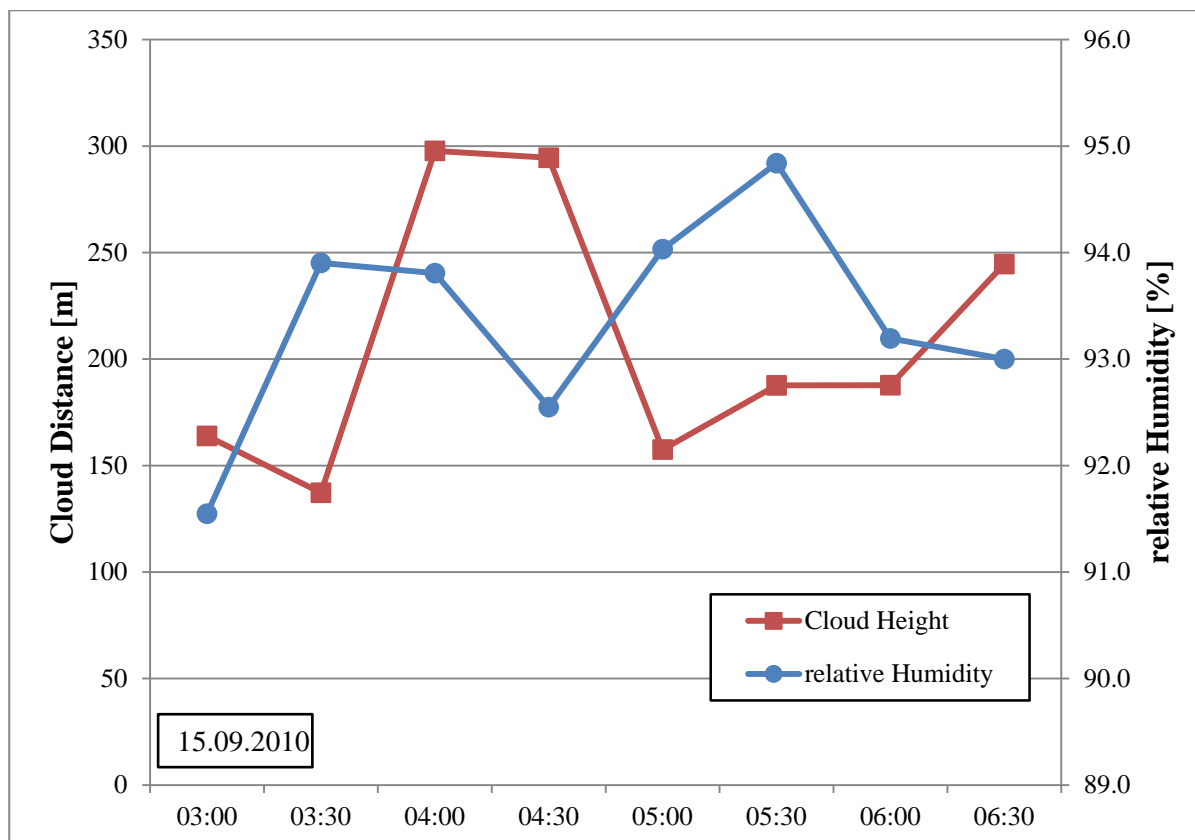


Fig. B 6 Cloud height and relative humidity on cloud event FCE1.2.

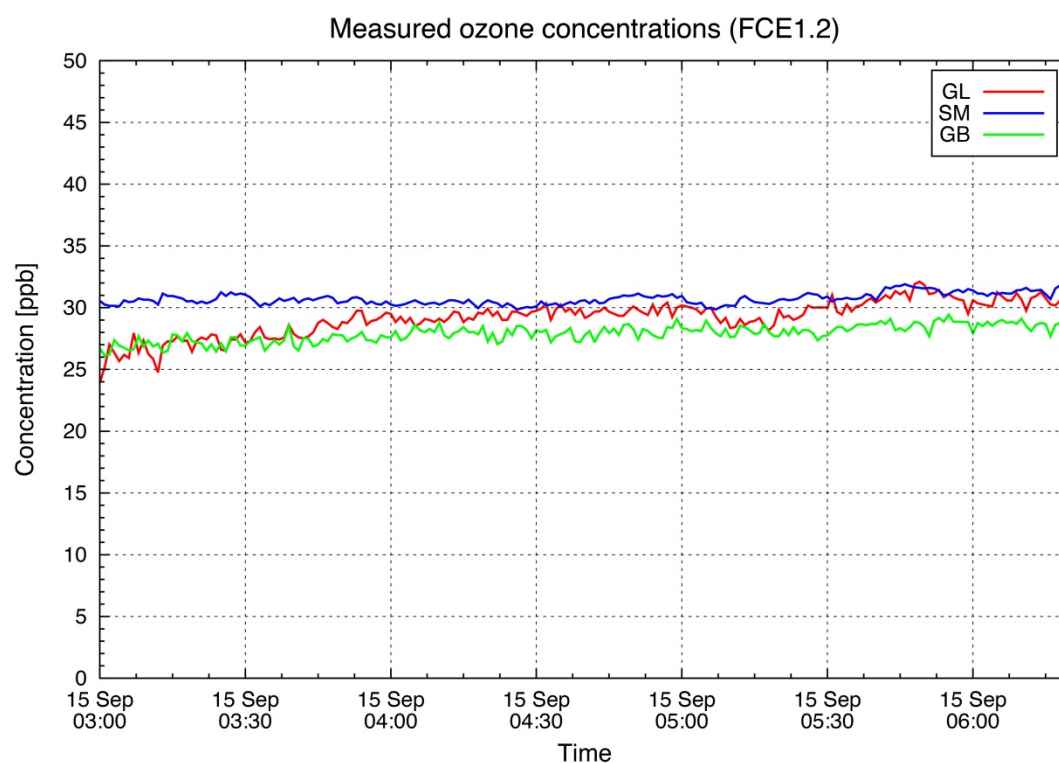


Fig. B 7 Measured ozone concentration over the full event.

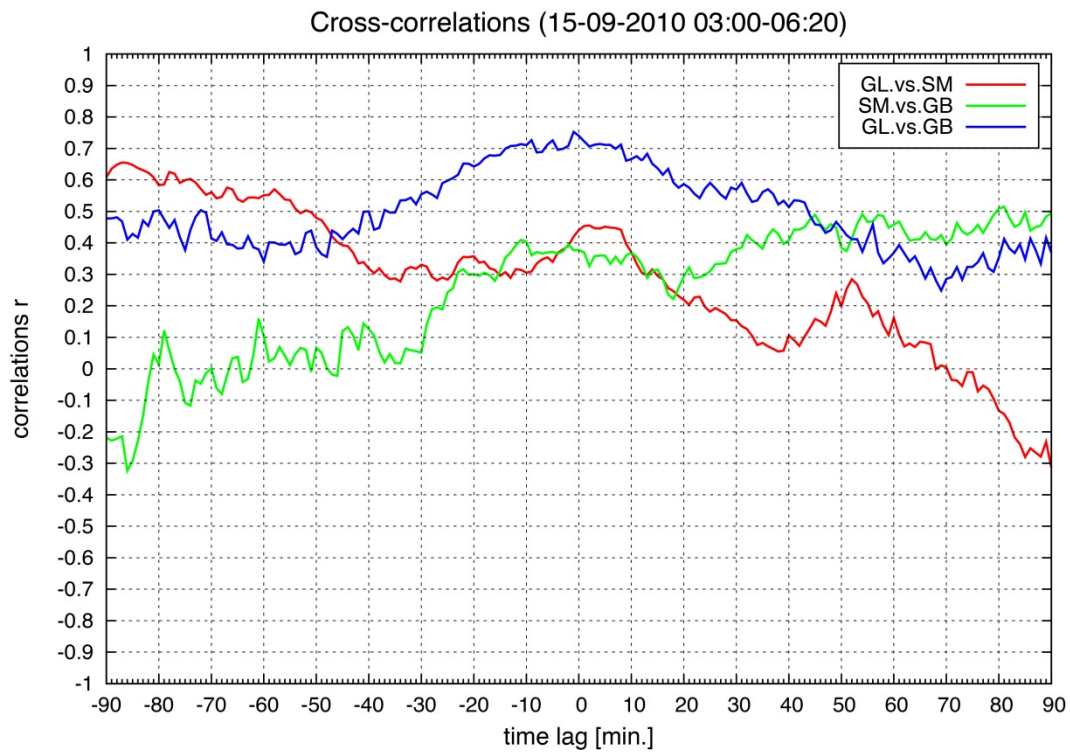


Fig. B 8 Cross-correlation of the full event.

C: FCE2.1 (15-16).09.10 23:00 – 02:00 (CEST)

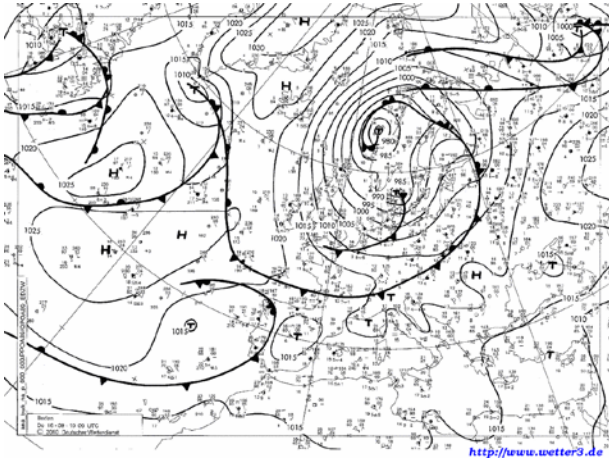


Fig. C 1 Surface weather charts on 16-09-2010, 00 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

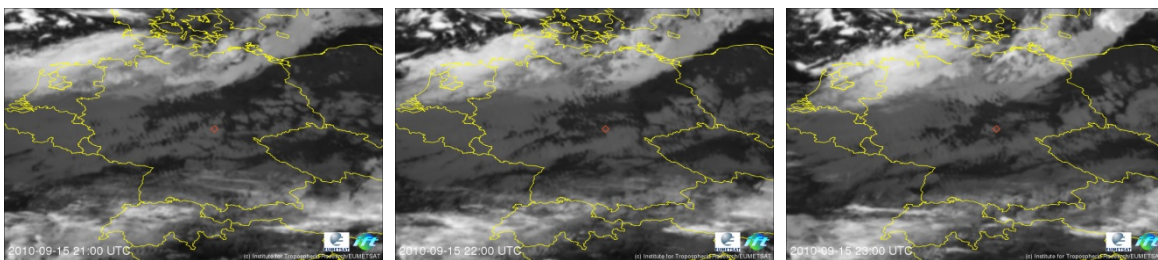


Fig. C 2 IR-satellite picture on 15-09-2010, 21, 22 and 23 UTC (source: ©TROPOS/EUMETSAT).

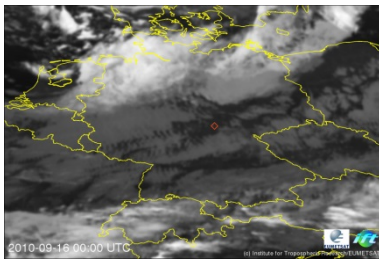


Fig. C 3 IR-satellite picture on 16-09-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

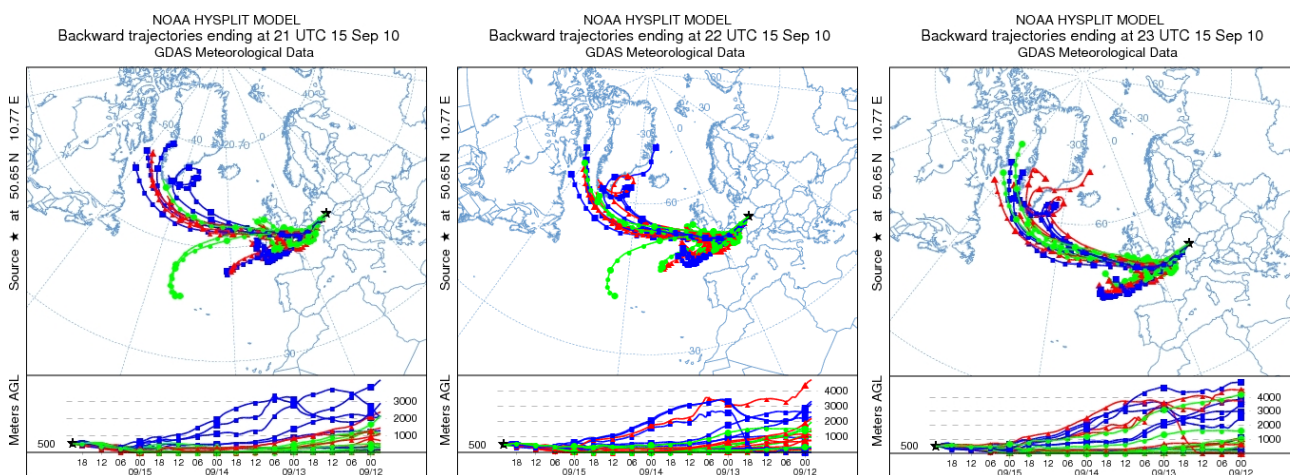


Fig. C 4 Backward trajectories on 15-09-2010, 21, 22 and 23 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

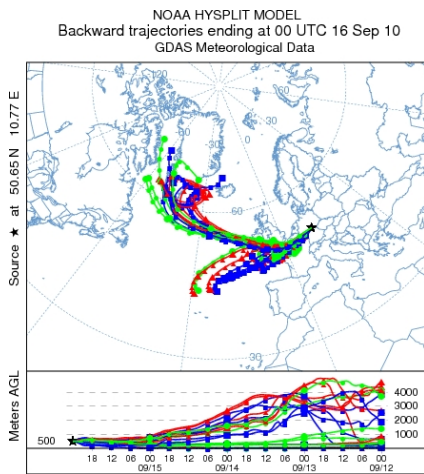


Fig. C 5 Backward trajectories on 16-09-2010, 00 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

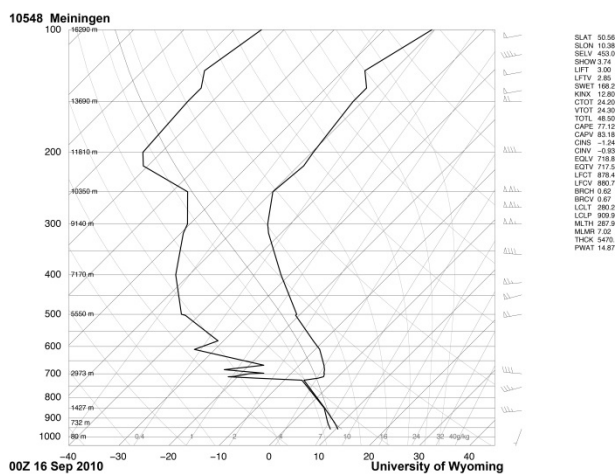


Fig. C 6 Vertical rawinsonde profiles of temperature and dew-point temperature on 16-09-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table C 1 Locally measured meteorological data at the summit station Schmücke on 16-09-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
15-09-201023:00	6.7	898.2	0.0	6.7	247.8
15-09-201023:10	6.7	898.2	0.0	7.3	238.9
15-09-201023:20	6.8	898.1	0.0	7.7	236.0
15-09-201023:30	6.8	898.1	0.0	8.1	234.5
15-09-201023:40	6.8	898.1	0.0	7.9	238.3
15-09-201023:50	6.8	898.2	0.0	8.3	242.0
16-09-2010 00:00	6.9	898.1	0.0	8.6	242.1
16-09-2010 00:10	6.9	898.1	0.0	8.3	241.8
16-09-2010 00:20	6.9	897.9	0.0	8.9	238.6
16-09-2010 00:30	6.9	897.9	0.0	8.9	237.7
16-09-2010 00:40	6.9	897.9	0.0	8.9	240.7
16-09-2010 00:50	6.9	897.6	0.0	9.3	241.2
16-09-2010 01:00	6.8	897.6	0.0	9.4	243.1
16-09-2010 01:10	6.7	897.6	0.0	9.5	241.4

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
16-09-2010 01:20	6.6	897.5	0.0	8.1	246.4
16-09-2010 01:30	6.6	897.5	0.0	9.0	243.1
16-09-2010 01:40	6.8	897.5	0.0	10.2	235.9
16-09-2010 01:50	6.7	897.4	0.0	10.7	248.7

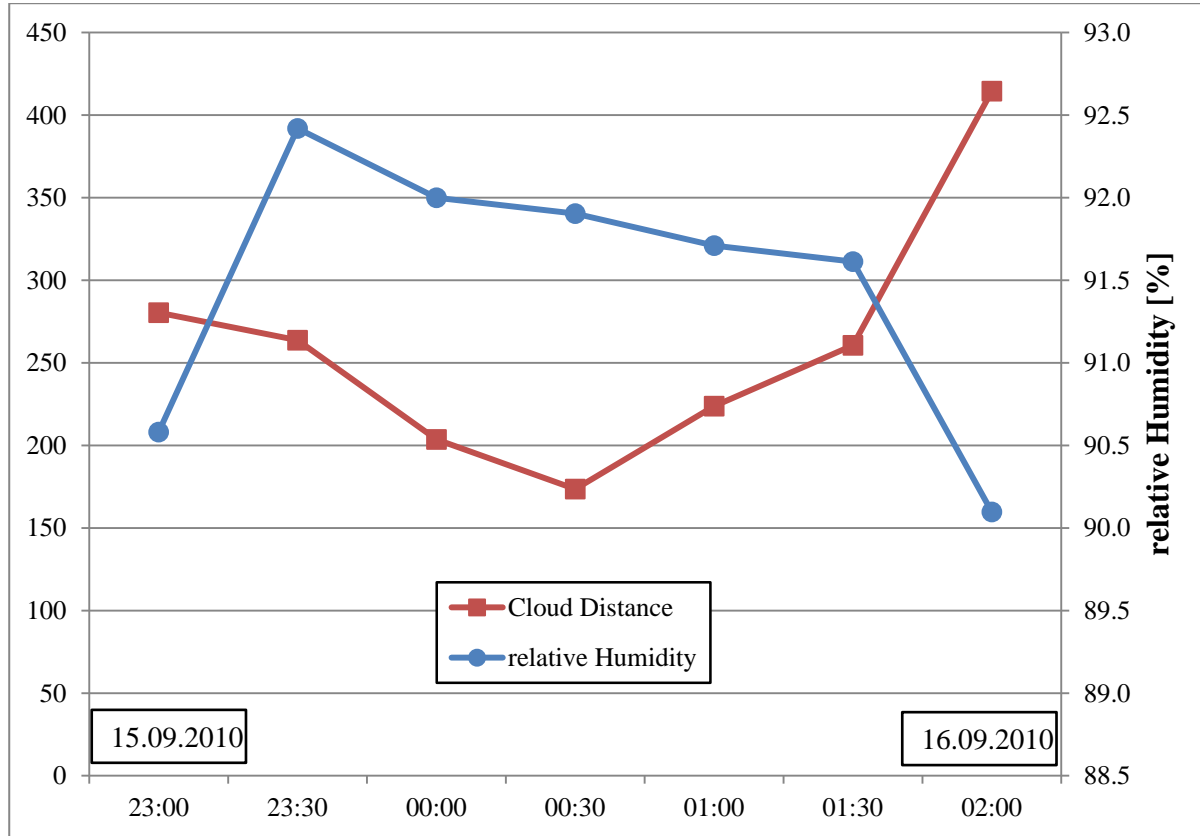


Fig. C 7 Cloud height and relative humidity on cloud event FCE2.1.

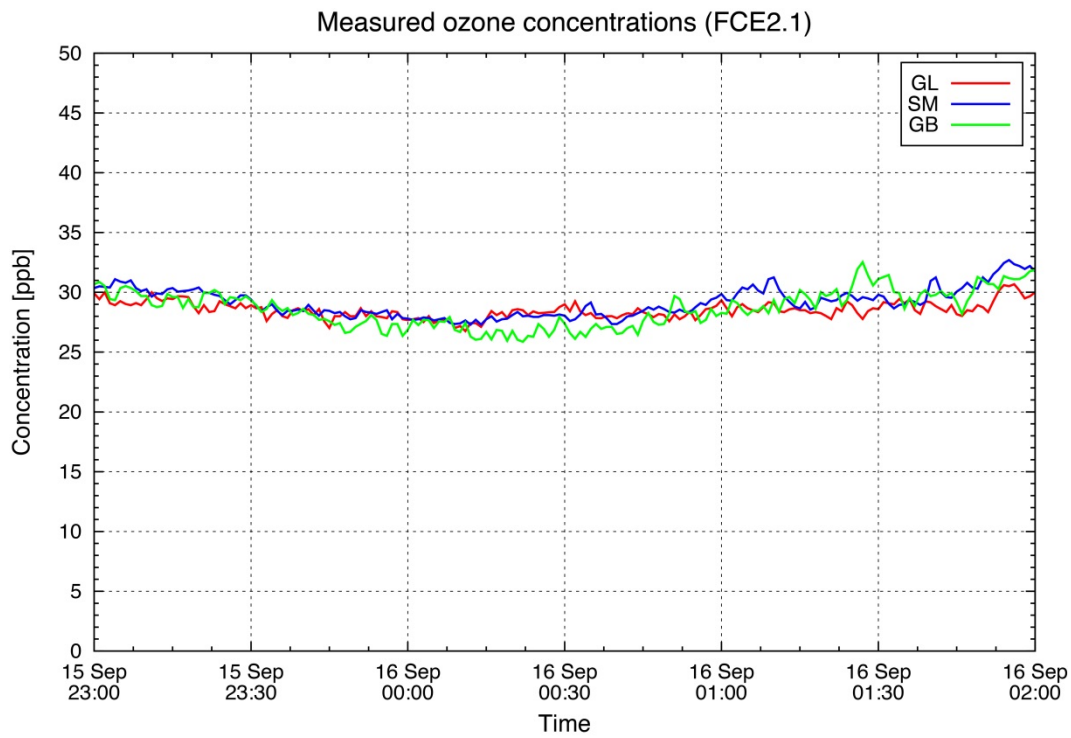


Fig. C 8 Measured ozone concentration over the full event.

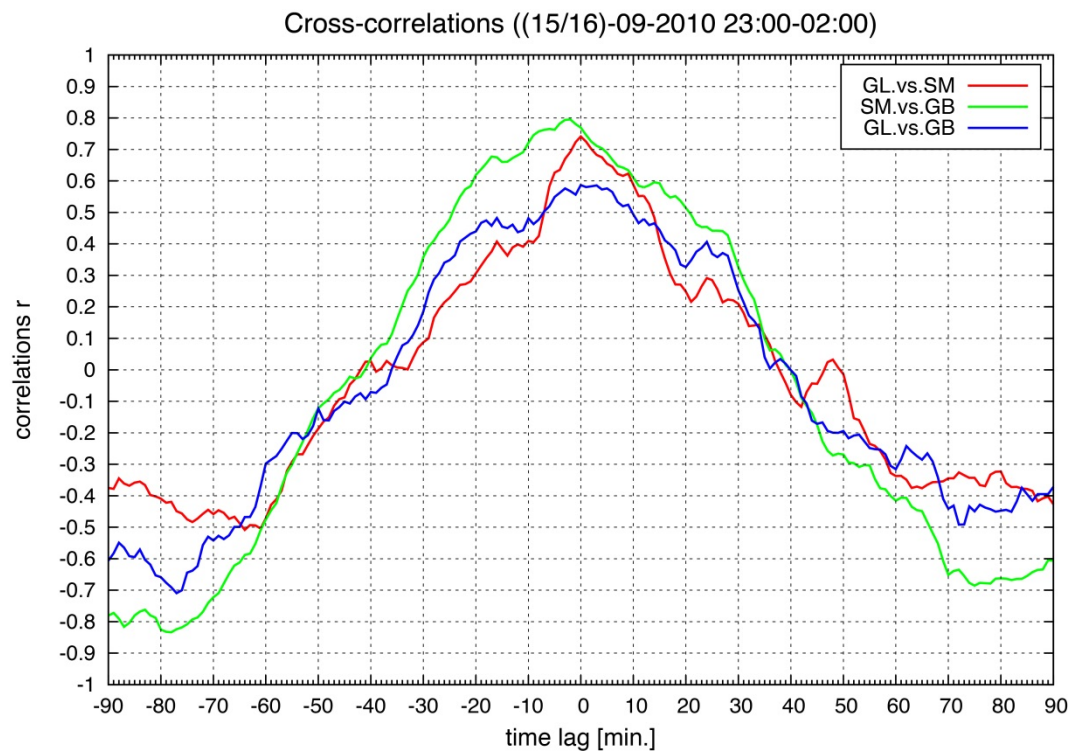
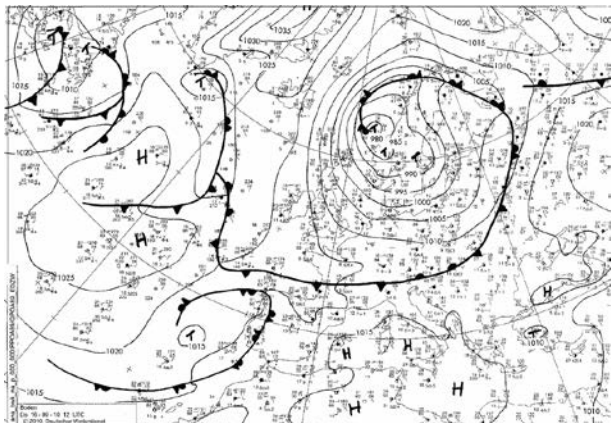


Fig. C 9 Cross-correlation of the full event.

D: FCE4.1 16.09.10 13:10 – 15:00 (CEST)



<http://www.wetter3.de>

Fig. D 1 Surface weather charts on 16-09-2010, 12 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

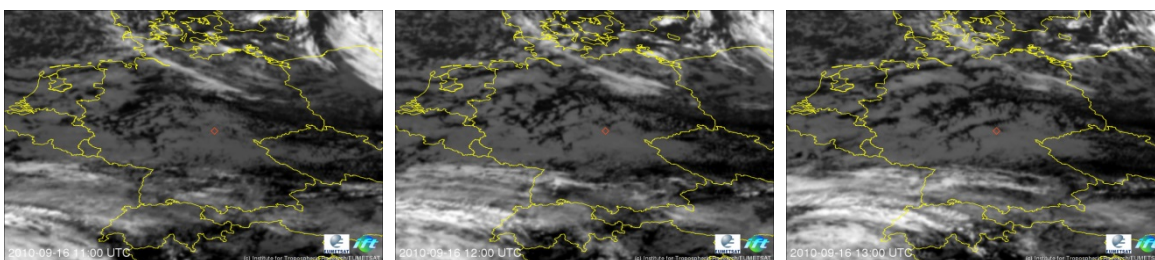


Fig. D 2 IR-satellite picture on 16-09-2010, 11, 12 and 13 UTC (source: ©TROPOS/EUMETSAT).

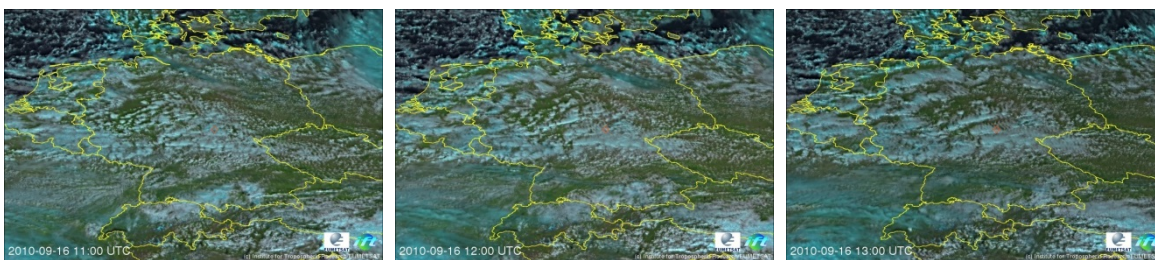


Fig. D 3 VIS-satellite picture on 16-09-2010, 11, 12 and 13 UTC (source: ©TROPOS/EUMETSAT).

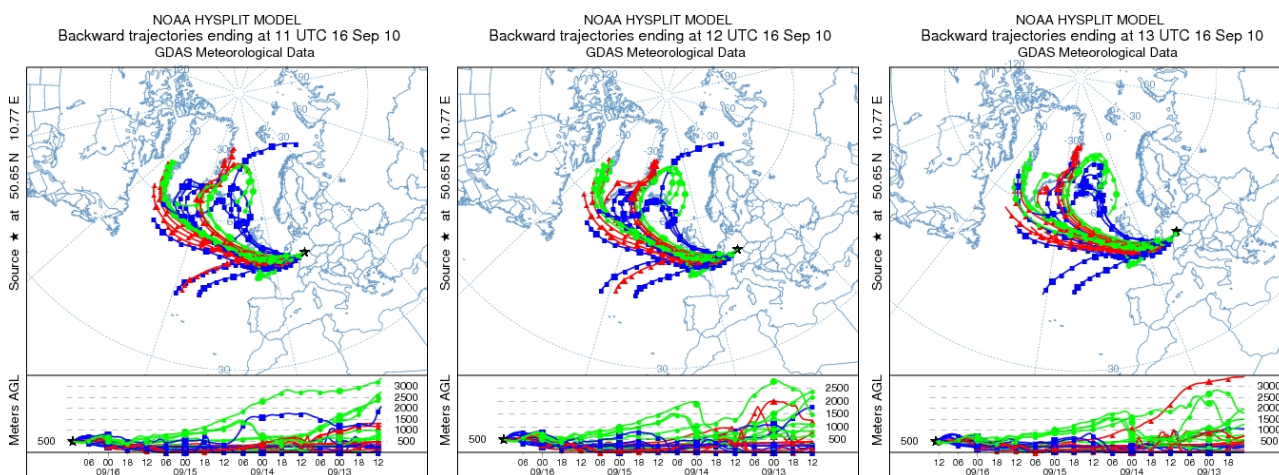


Fig. D 4 Backward trajectories on 16-09-2010, 11, 12 and 13 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

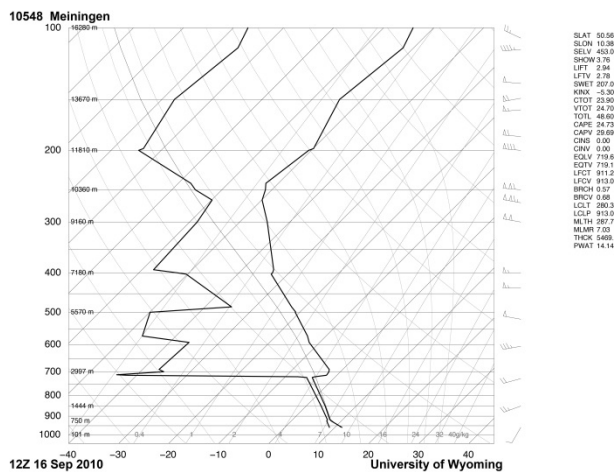


Fig. D 5 Vertical rawinsonde profiles of temperature and dew-point temperature on 16-09-2010, 12 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table D 1 Locally measured meteorological data at the summit station Schmücke on 16-09-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
16-09-2010 13:10	6.8	900.4	0.0	7.9	228.2
16-09-2010 13:20	6.8	900.6	0.0	7.7	224.4
16-09-2010 13:30	6.8	900.7	0.6	7.8	226.8
16-09-2010 13:40	6.8	900.7	0.0	7.1	253.2
16-09-2010 13:50	6.9	900.5	0.0	7.1	249.7
16-09-2010 14:00	6.8	900.5	0.2	7.6	246.5
16-09-2010 14:10	6.8	900.5	0.0	7.4	252.1
16-09-2010 14:20	6.8	900.5	0.0	7.6	246.1
16-09-2010 14:30	6.8	900.4	0.0	7.3	248.0
16-09-2010 14:40	6.9	900.3	0.0	6.8	241.0
16-09-2010 14:50	7.1	900.3	0.0	6.2	242.4

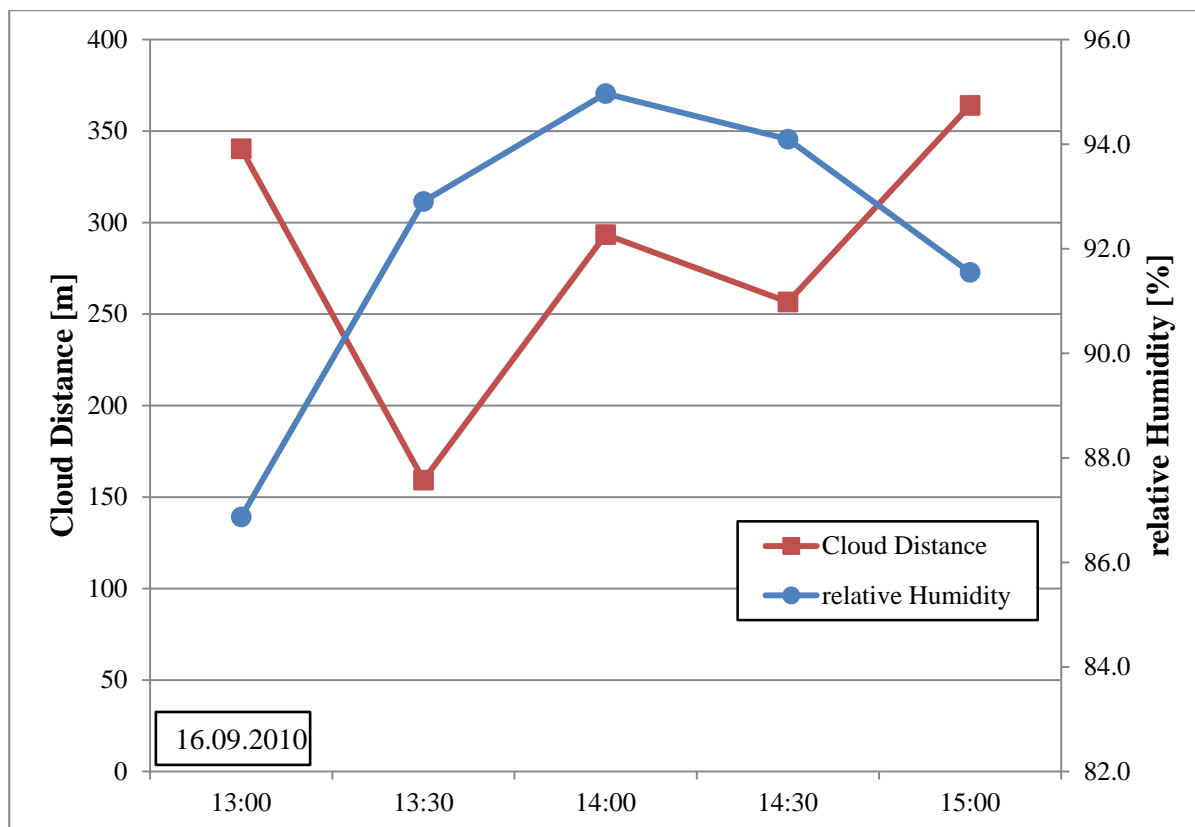


Fig. D 6 Cloud height and relative humidity on cloud event FCE4.1.

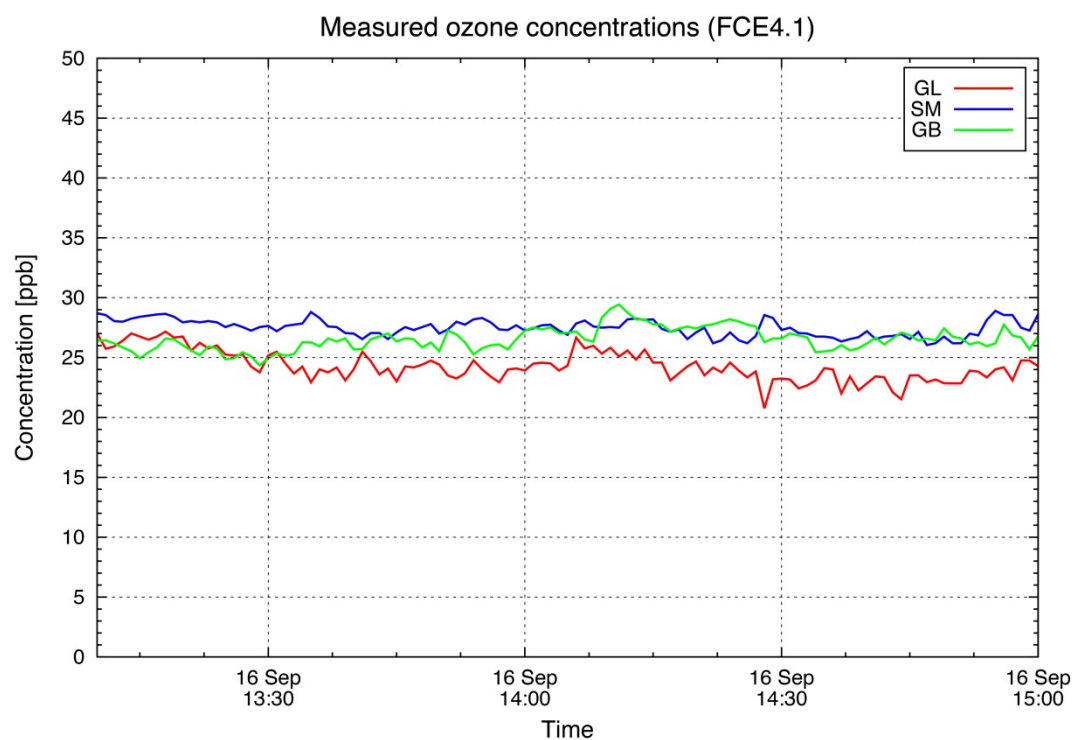


Fig. D 7 Measured ozone concentration over the full event.

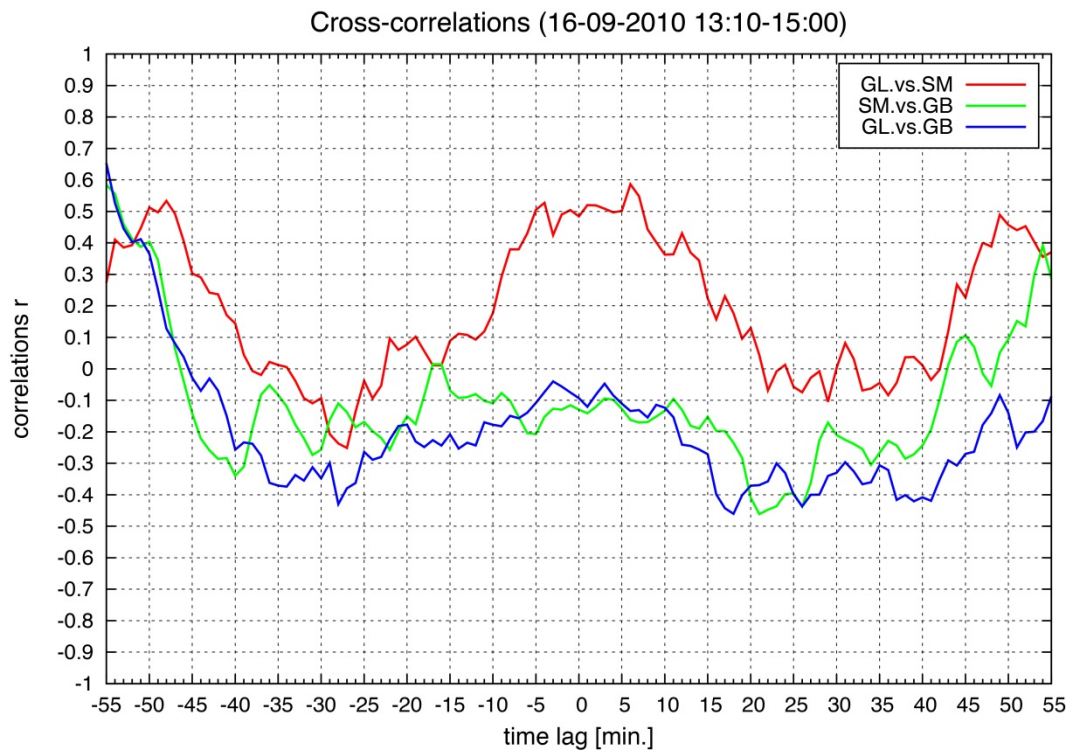
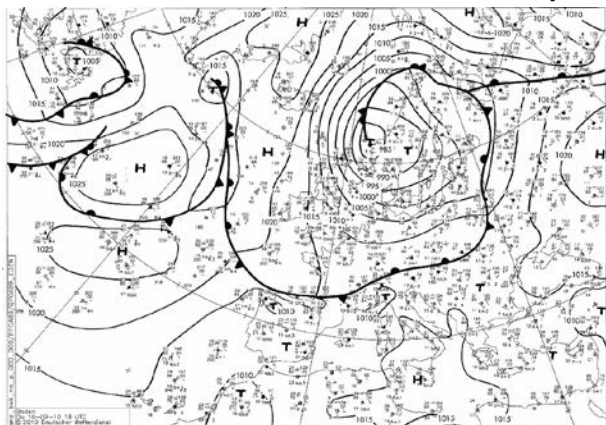


Fig. D 8 Cross-correlation of the full event.

E: FCE5.1 16.09.10 21:40 – 23:50 (CEST)



<http://www.wetter3.de>

Fig. E 1 Surface weather charts on 16-09-2010, 18 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

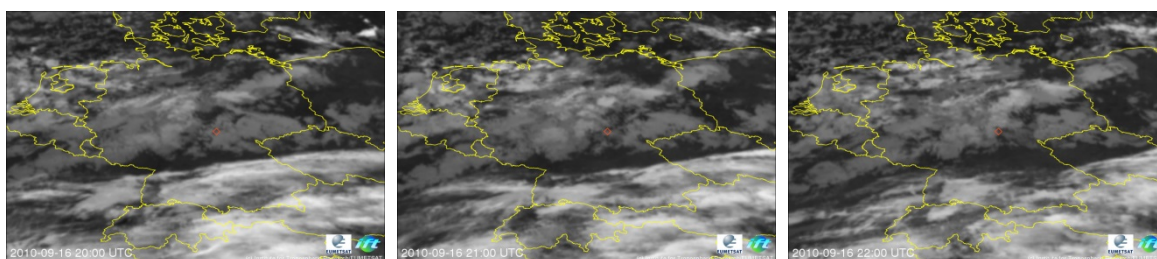


Fig. E 2 IR-satellite picture on 16-09-2010, 20, 21 and 22 UTC (source: ©TROPOS/EUMETSAT).

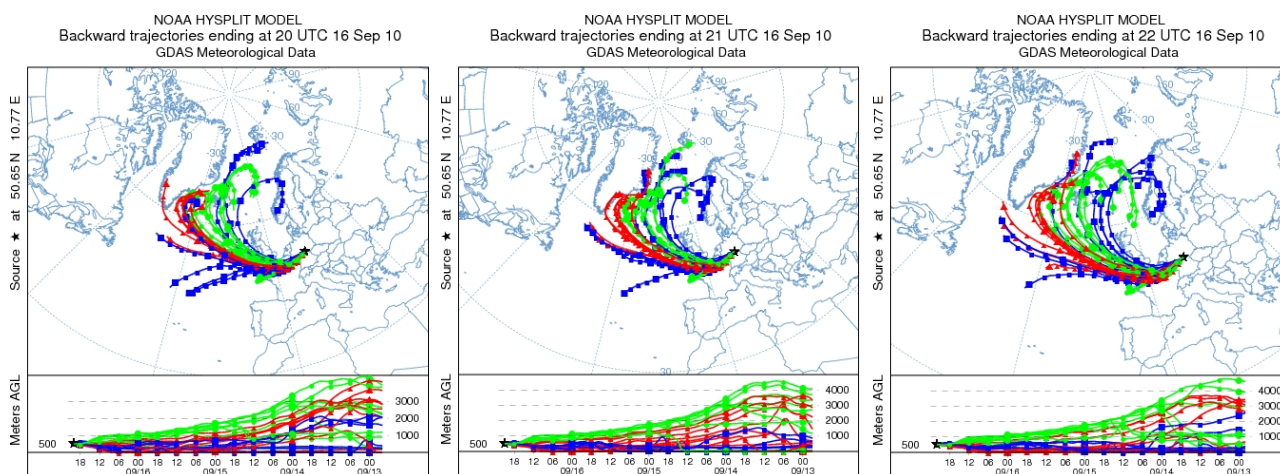


Fig. E 3 Backward trajectories on 16-09-2010, 20, 21 and 22 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

Table E 1 Locally measured meteorological data at the summit station Schmücke on 16-09-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
16-09-2010 21:40	7.1	900.1	0.0	6.8	230.5
16-09-2010 21:50	7.1	899.8	0.0	6.1	236.8
16-09-2010 22:00	7.1	899.9	0.0	6.2	241.7
16-09-2010 22:10	7.0	900.0	0.0	6.9	253.3
16-09-2010 22:20	6.9	900.2	0.0	6.9	236.3

16-09-2010 22:30	6.9	900.2	0.0	5.8	246.5
time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
16-09-2010 22:40	6.9	900.2	0.0	5.8	246.1
16-09-2010 22:50	6.9	900.1	0.0	6.4	249.9
16-09-2010 23:00	6.9	900.0	0.0	5.7	243.5
16-09-2010 23:10	6.9	899.9	0.0	5.6	240.6
16-09-2010 23:20	6.9	899.9	0.0	5.7	247.7
16-09-2010 23:30	6.9	899.8	0.0	5.7	232.6
16-09-2010 23:40	6.9	899.8	0.0	7.6	222.3
16-09-2010 23:50	6.9	899.7	0.0	9.4	179.2

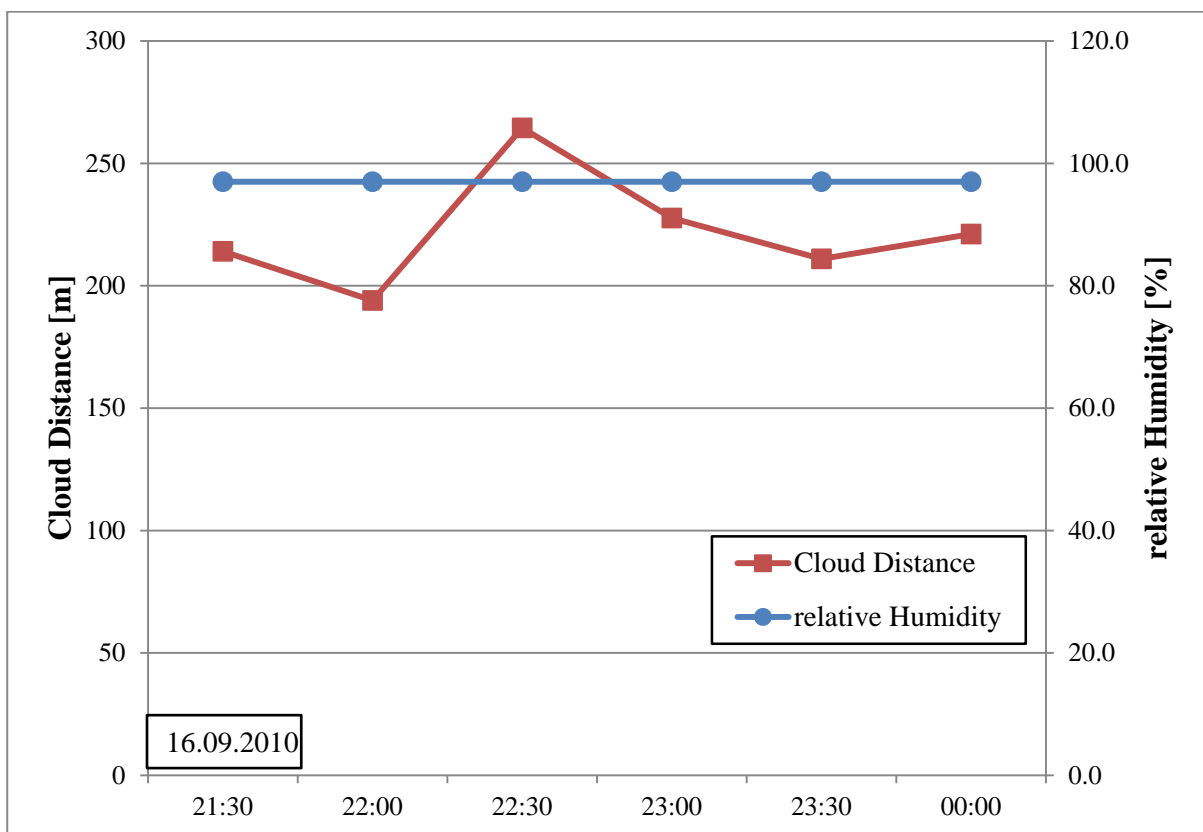


Fig. E 4 Cloud height and relative humidity on cloud event FCE5.1.

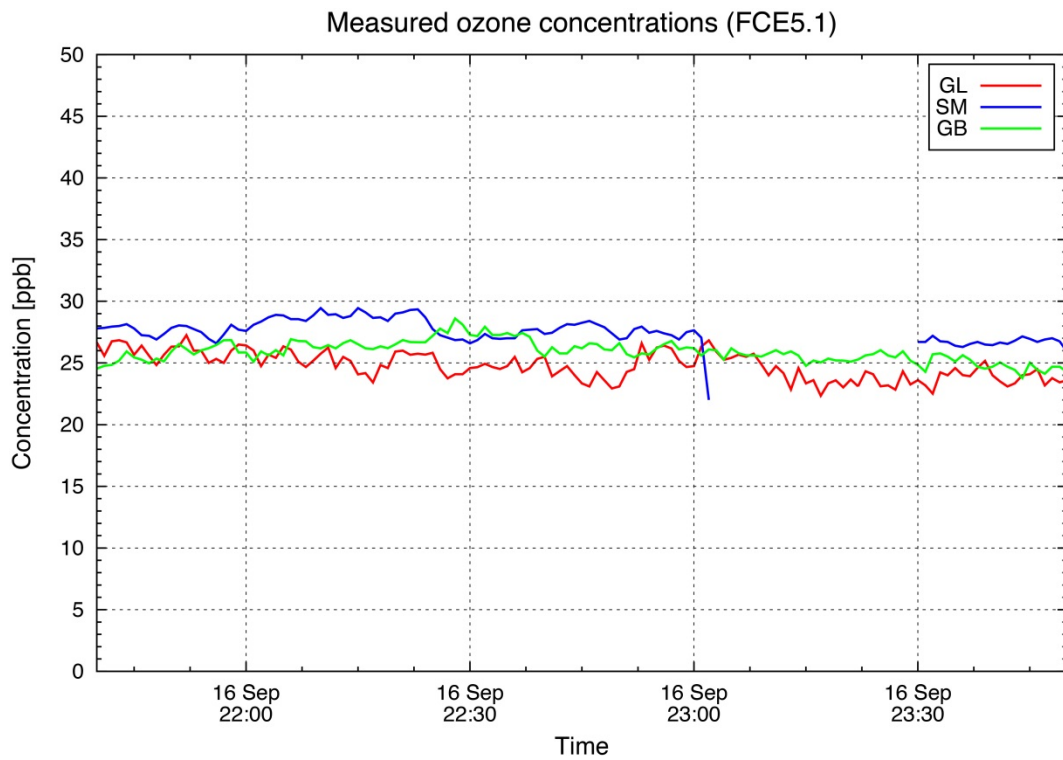


Fig. E 5 Measured ozone concentration over the full event.

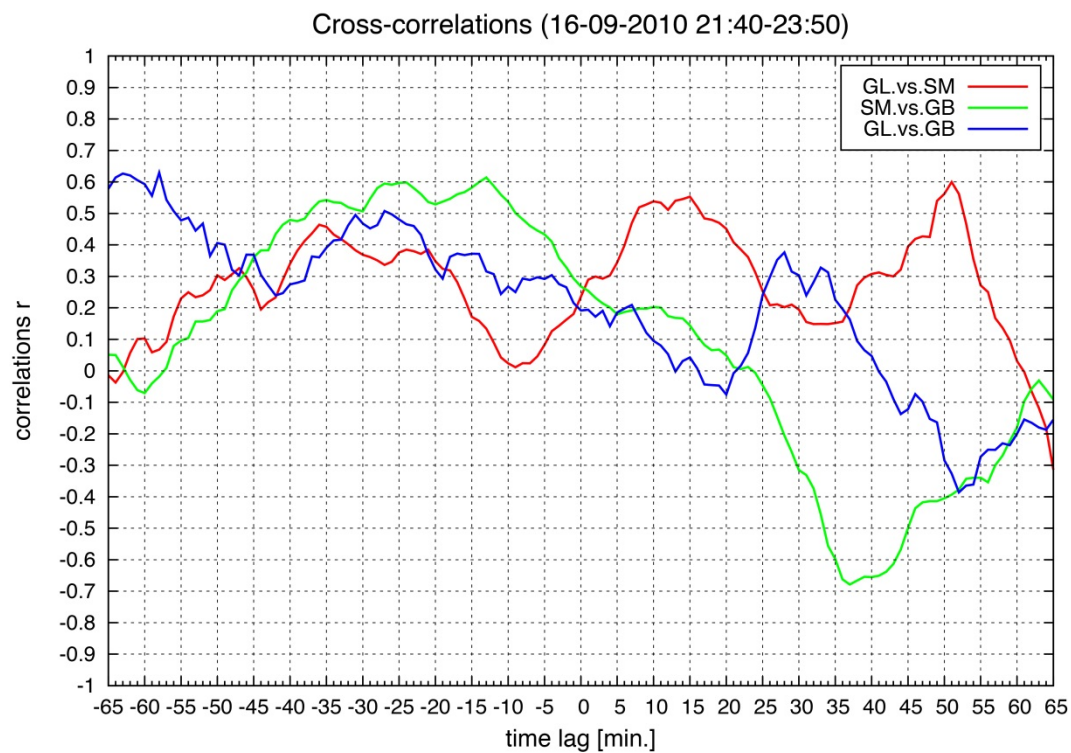
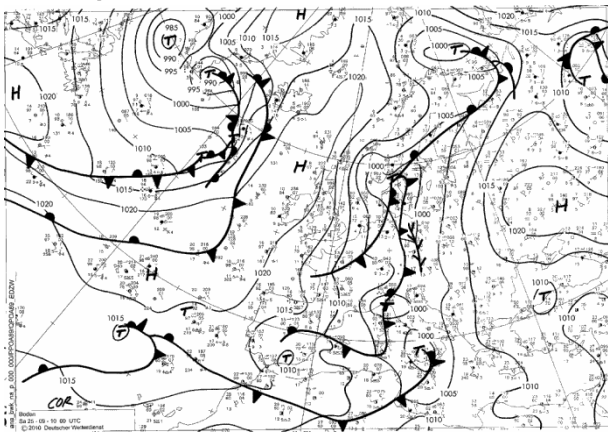


Fig. E 6 Cross-correlation of the full event.

F: FCE7.1 (24-25).09.10 21:10 – 01:45 (CEST) (offline sampling 23:45 – 01:45 CEST)



<http://www.wetter3.de>

Fig. F 1 Surface weather charts on 25-09-2010, 00 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

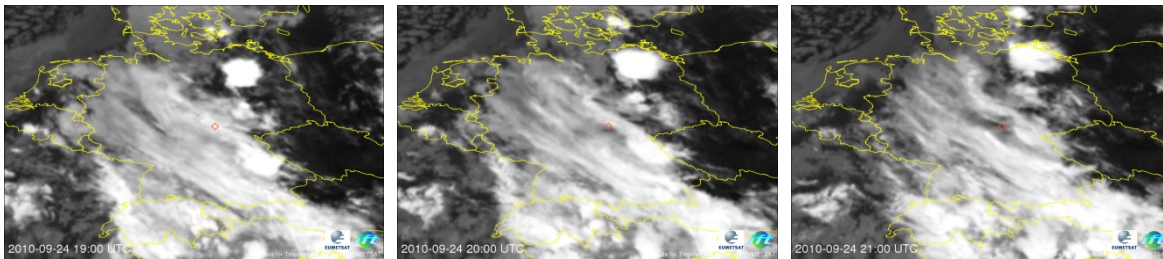


Fig. F 2 IR-satellite picture on 24-09-2010, 19, 20 and 21 UTC (source: ©TROPOS/EUMETSAT).

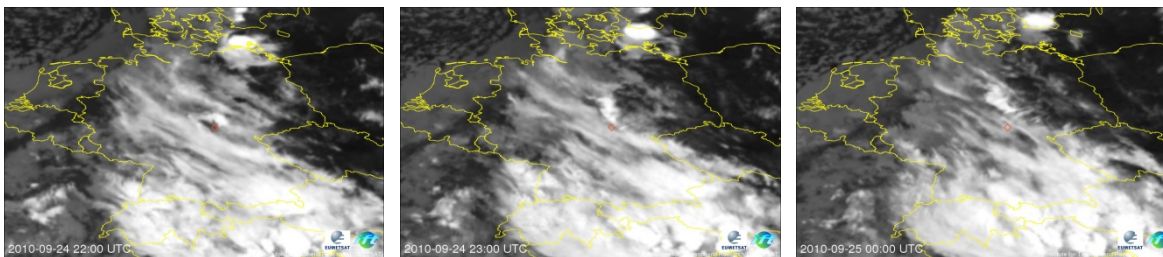


Fig. F 3 IR-satellite picture on 24-09-2010, 22 and 23 and 25-09-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

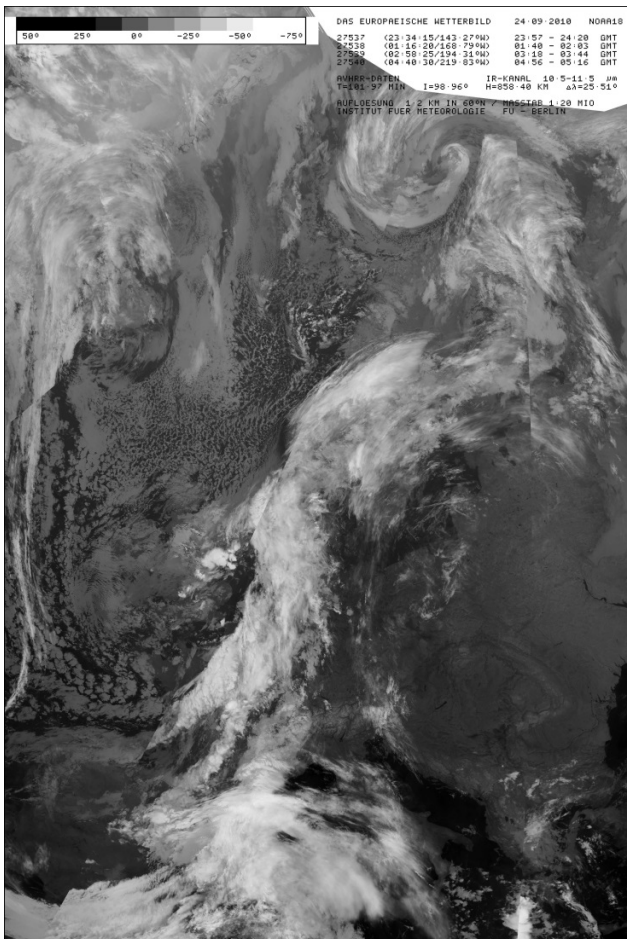


Fig. F 4 NOAA satellite pictures on 24-09-2010 (source: Berliner Wetterkarte e.V., 2010).

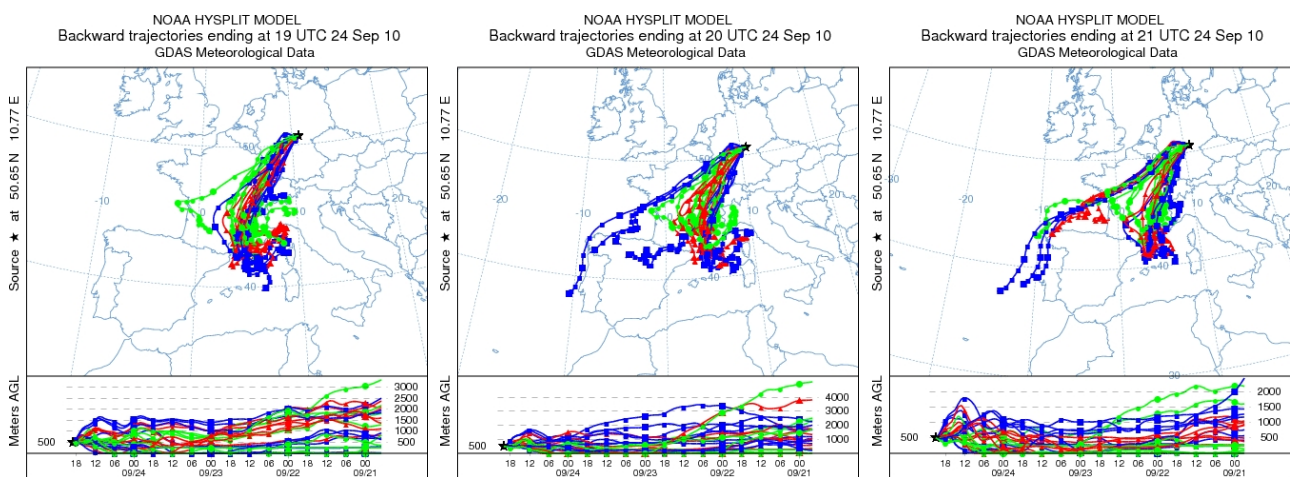


Fig. F 5 Backward trajectories on 24-09-2010, 19, 20 and 21 (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

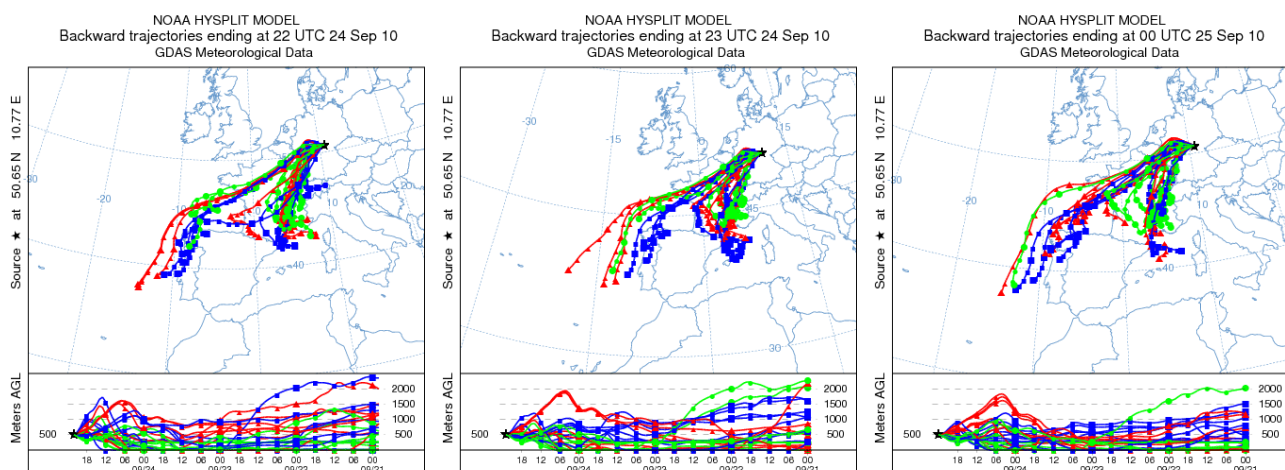


Fig. F 6 Backward trajectories on 24-09-2010, 22, 23 and 25-09-2010, 00 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

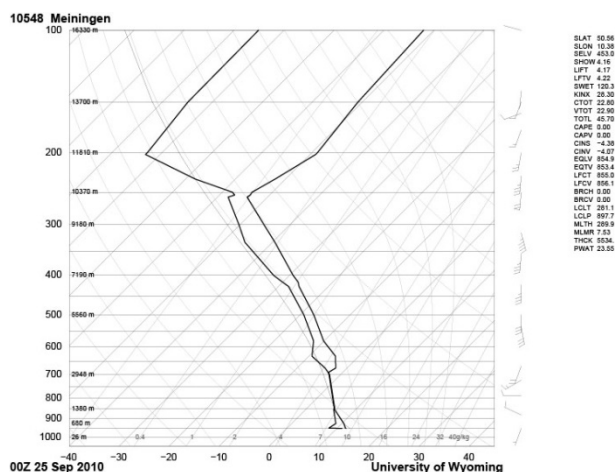


Fig. F 7 Vertical rawinsonde profiles of temperature and dew-point temperature on 25-09-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table F 1 Locally measured meteorological data at the summit station Schmücke on 24/25-09-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
24-09-2010 21:10	10.3	892.9	0.0	6.5	231.9
24-09-2010 21:20	10.2	893.0	0.0	7.0	218.5
24-09-2010 21:30	10.0	892.9	0.0	7.1	225.9
24-09-2010 21:40	9.7	892.9	0.0	7.9	224.0
24-09-2010 21:50	9.7	893.0	0.0	7.0	225.4
24-09-2010 22:00	9.7	893.0	0.0	6.5	233.0
24-09-2010 22:10	9.5	893.0	0.0	6.8	218.3
24-09-2010 22:20	9.3	892.9	0.0	7.4	217.8
24-09-2010 22:30	9.2	892.9	0.0	6.5	225.9
24-09-2010 22:40	9.0	892.9	0.0	6.2	232.1
24-09-2010 22:50	8.8	893.0	0.0	5.6	233.3
24-09-2010 23:00	8.7	893.0	0.0	6.0	232.1
24-09-2010 23:10	8.7	893.0	0.0	7.2	227.0

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
24-09-2010 23:20	8.7	893.0	0.0	6.6	231.5
24-09-2010 23:30	8.7	893.1	0.0	7.3	220.3
24-09-2010 23:40	8.5	893.1	0.0	7.8	227.1
24-09-2010 23:50	8.4	893.1	0.0	7.8	224.5
25-09-2010 00:00	8.5	893.1	0.0	7.1	231.1
25-09-2010 00:10	8.5	893.1	0.0	5.8	238.2
25-09-2010 00:20	8.4	893.1	0.0	6.0	237.9
25-09-2010 00:30	8.4	893.2	0.0	6.2	226.0
25-09-2010 00:40	8.4	893.2	0.0	5.8	236.8
25-09-2010 00:50	8.3	893.2	0.0	5.4	246.4
25-09-2010 01:00	8.2	893.3	0.0	4.1	263.2
25-09-2010 01:10	8.2	893.3	0.0	3.9	252.0
25-09-2010 01:20	8.1	893.3	0.0	4.7	263.6
25-09-2010 01:30	7.9	893.2	0.0	4.9	264.4
25-09-2010 01:40	7.8	893.1	0.0	5.0	260.5
25-09-2010 01:45	7.8	893.0	0.0	4.9	256.5

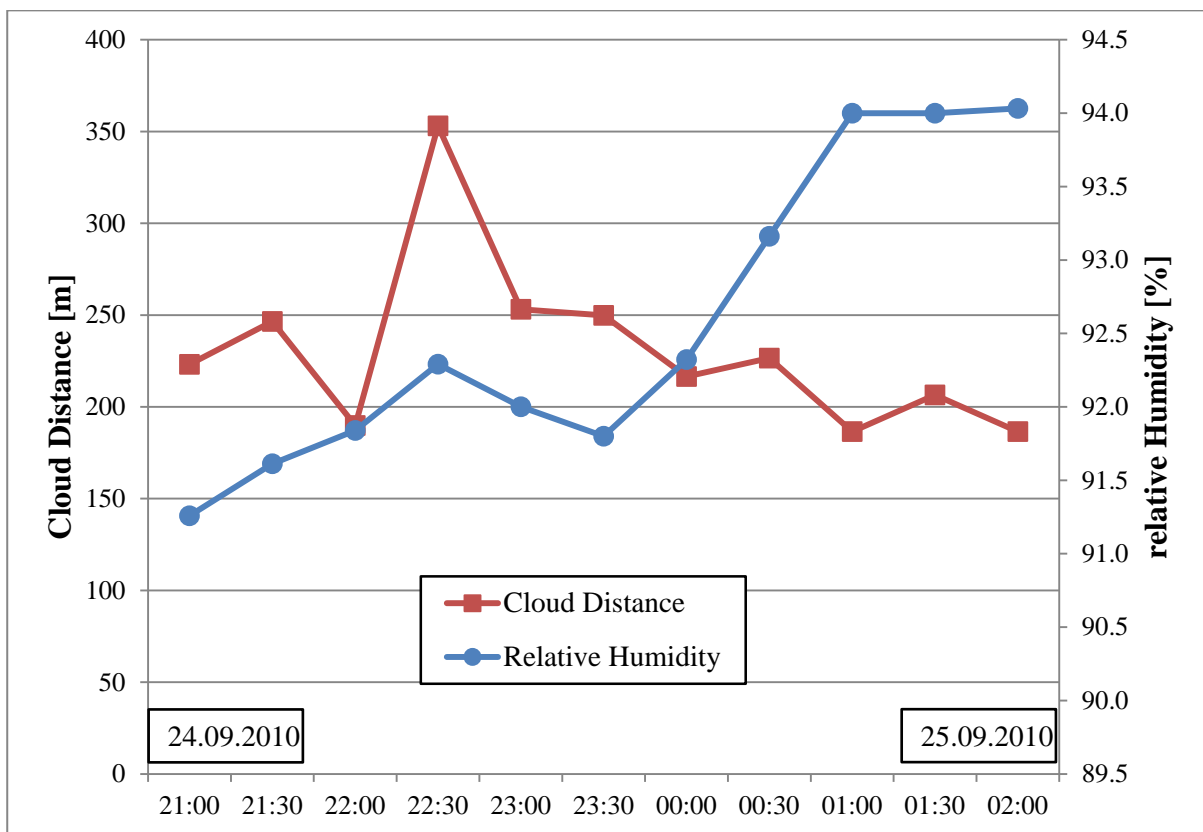


Fig. F 8 Cloud height and relative humidity on cloud event FCE7.1.

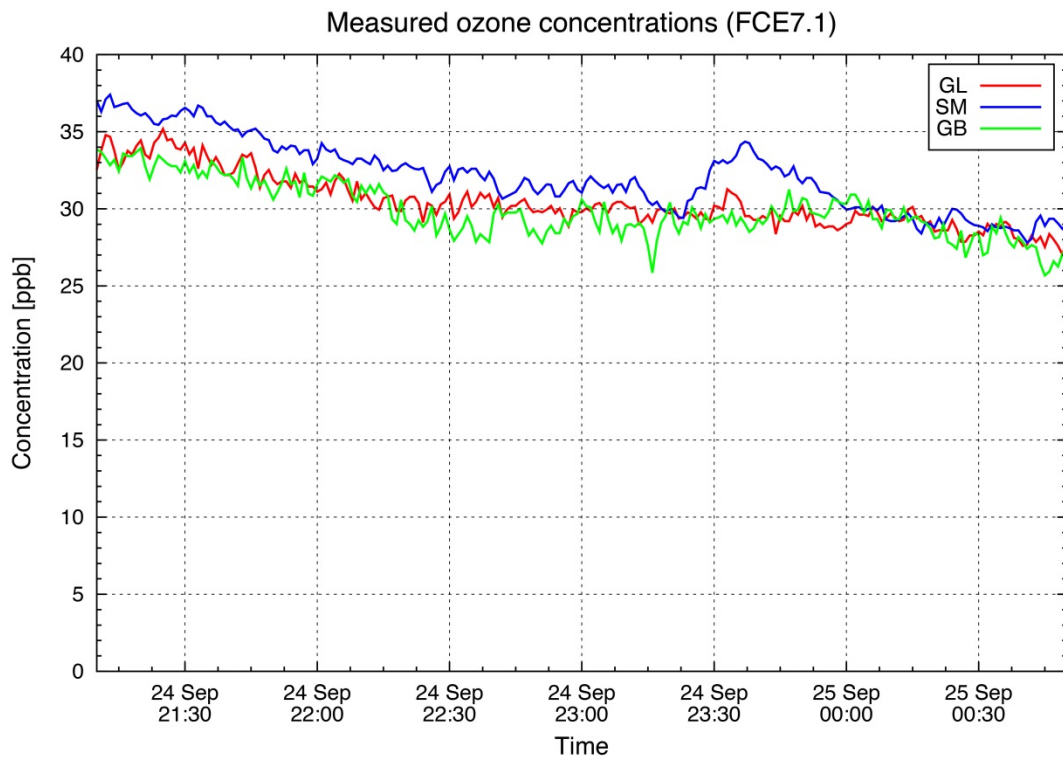


Fig. F 9 Measured ozone concentration over the full event.

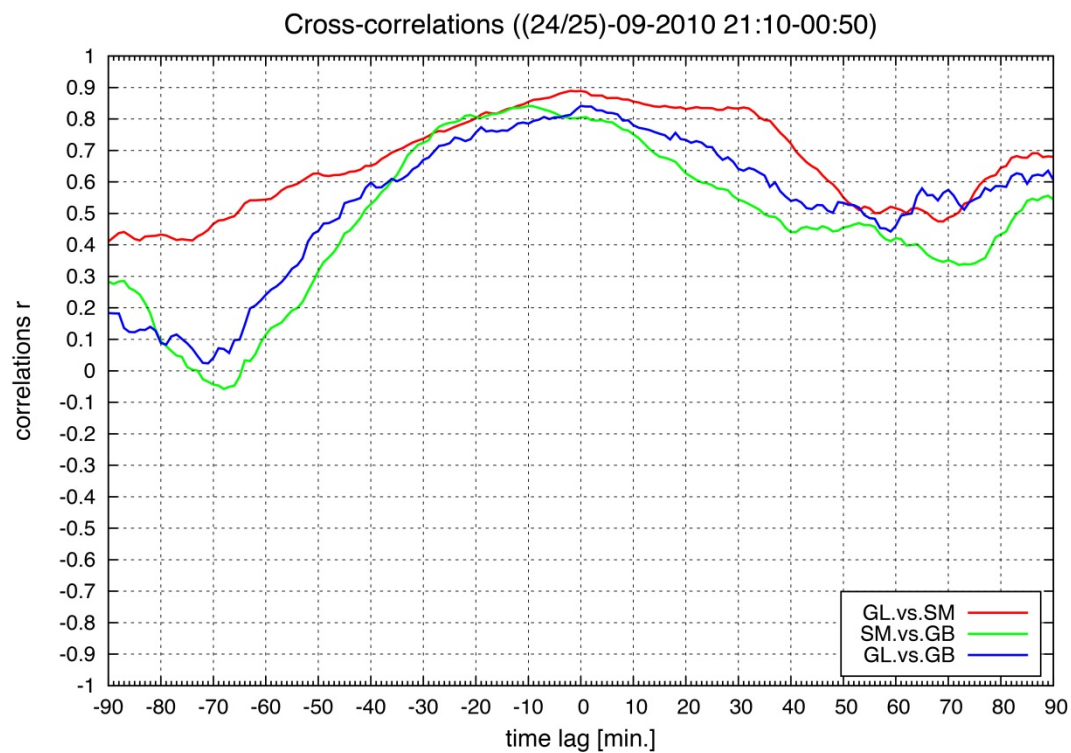
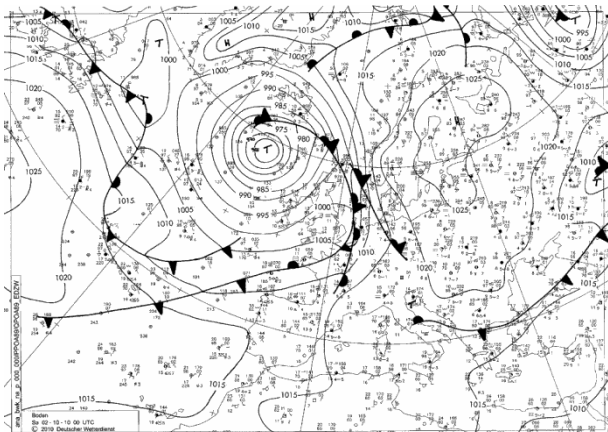


Fig. F 10 Cross-correlation of the full event.

G: FCE11.2 (01-02).10.10 20:50 – 05:30 (CEST) (offline sampling 22:30 – 05:30 CEST)



<http://www.wetter3.de>

Fig. G 1 Surface weather charts on 02-10-2010, 00 (source: www.wetter3.de (©Deutscher Wetterdienst)).

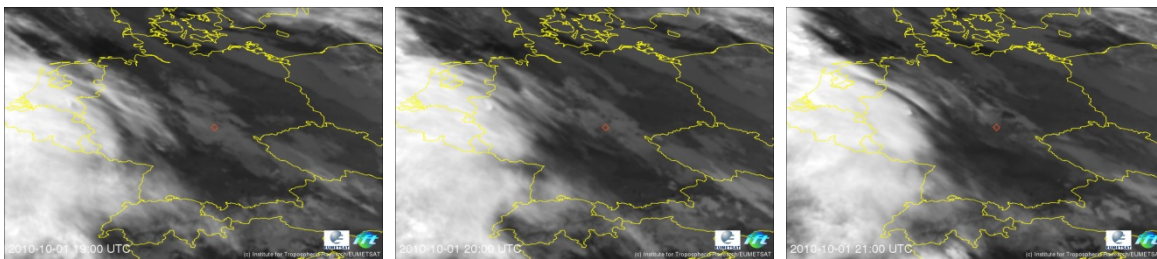


Fig. G 2 IR-satellite picture on 01-10-2010, 19, 20 and 21 UTC (source: ©TROPOS/EUMETSAT).

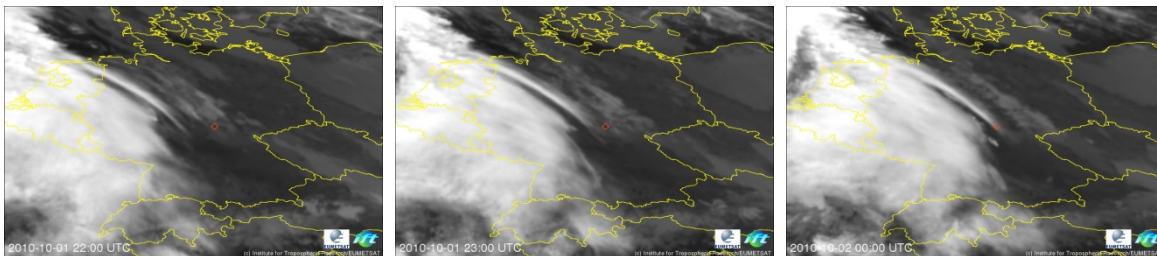


Fig. G 3 IR-satellite picture on 01-10-2010, 22 and 23 and 02 October 00 UTC (source: ©TROPOS/EUMETSAT).

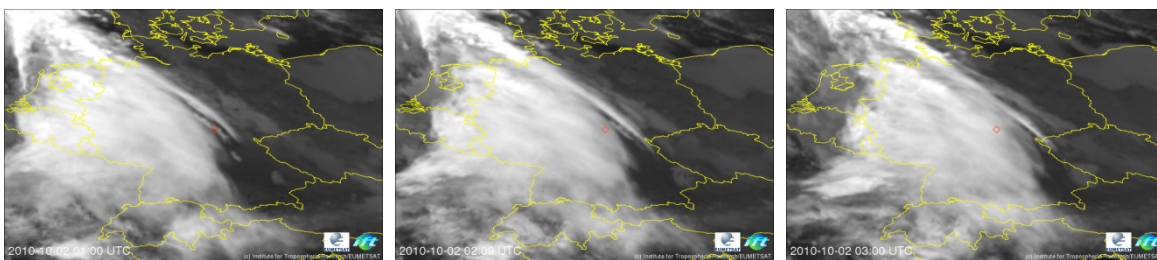


Fig. G 4 IR-satellite picture on 02-10-2010, 01, 02 and 03 UTC (source: ©TROPOS/EUMETSAT).



Fig. G 5 IR-satellite picture on 02-10-2010, 04 (source: ©TROPOS/EUMETSAT).

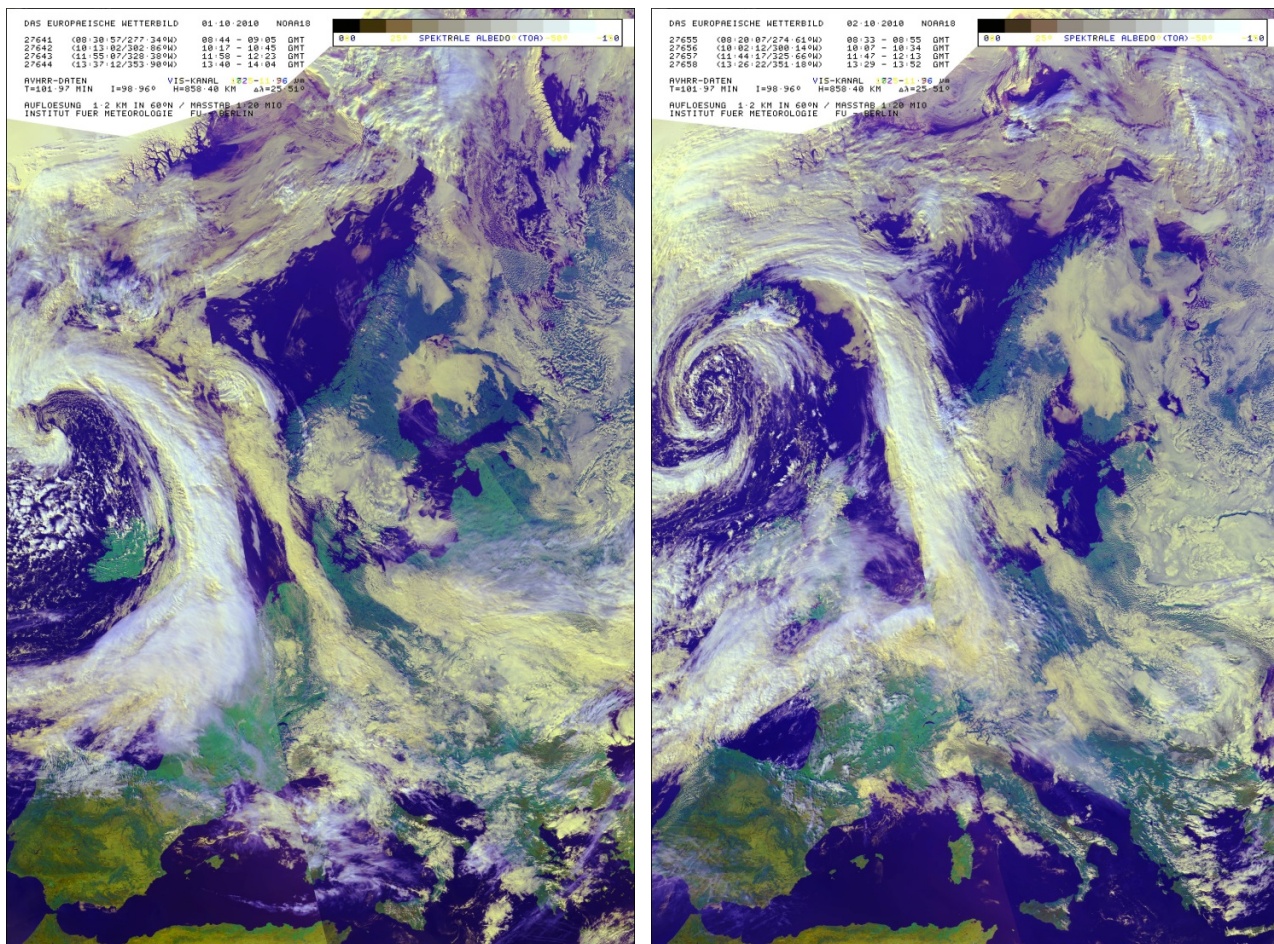


Fig. G 6 NOAA satellite pictures on 01-10-2010 and on 02-10-2010 (source: Berliner Wetterkarte e.V., 2010).

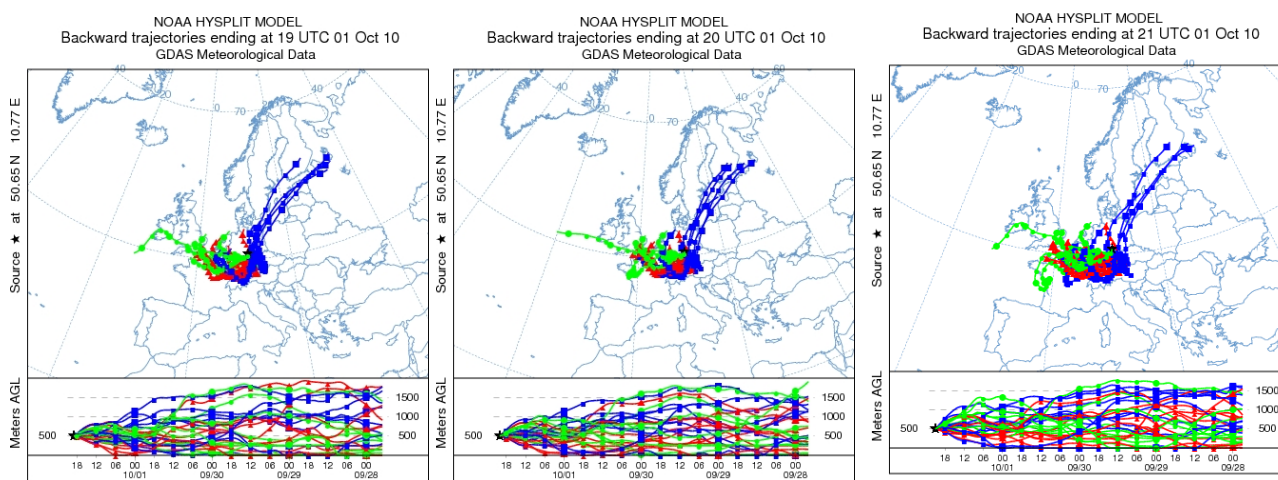


Fig. G 7 Backward trajectories on 01-10-2010, 19, 20 and 21 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

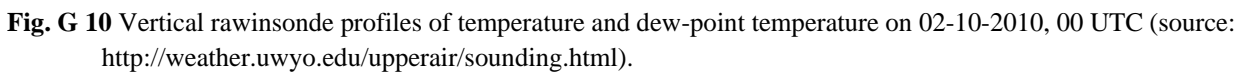
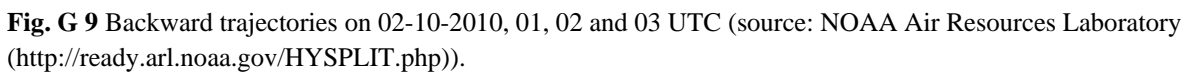
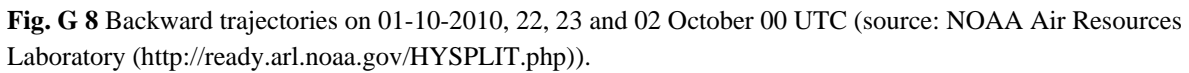


Table G 1 Locally measured meteorological data at the summit station Schmücke on 01/02-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
01-10-2010 20:50	6.2	904.3	0.0	2.6	239.5
01-10-2010 21:00	6.1	904.3	0.0	2.5	227.8
01-10-2010 21:10	6.1	904.3	0.0	2.7	220.5
01-10-2010 21:20	6.0	904.5	0.0	1.9	231.3
01-10-2010 21:30	6.0	904.5	0.0	2.5	213.6
01-10-2010 21:40	6.0	904.5	0.0	3.3	217.5
01-10-2010 21:50	5.9	904.4	0.0	3.2	208.0
01-10-2010 22:00	5.9	904.5	0.0	3.2	217.2
01-10-2010 22:10	5.9	904.5	0.0	2.4	201.5
01-10-2010 22:20	6.1	904.3	0.0	2.2	190.0
01-10-2010 22:30	6.2	904.3	0.0	1.7	192.5
01-10-2010 22:40	6.2	904.3	0.0	1.3	205.7
01-10-2010 22:50	6.1	904.2	0.0	1.5	215.3
01-10-2010 23:00	6.1	904.3	0.0	1.6	221.1
01-10-2010 23:10	6.1	904.3	0.0	2.3	215.1
01-10-2010 23:20	6.1	904.2	0.0	3.2	206.9
01-10-2010 23:30	6.0	904.3	0.0	3.1	216.6
01-10-2010 23:40	6.0	904.3	0.0	3.7	222.2
01-10-2010 23:50	6.0	904.3	0.0	2.9	210.8
02-10-2010 00:00	6.2	904.3	0.0	3.6	203.5
02-10-2010 00:10	6.2	904.3	0.0	3.9	209.0
02-10-2010 00:20	6.2	904.3	0.0	4.1	225.0
02-10-2010 00:30	6.1	904.3	0.0	4.1	219.4
02-10-2010 00:40	6.1	904.3	0.0	4.4	227.8
02-10-2010 00:50	6.0	904.3	0.0	4.9	224.0
02-10-2010 01:00	6.1	904.1	0.0	5.1	220.1
02-10-2010 01:10	6.2	904.0	0.0	4.8	233.2
02-10-2010 01:20	6.2	904.1	0.0	4.9	233.7
02-10-2010 01:30	6.2	904.1	0.0	4.6	228.5
02-10-2010 01:40	6.2	904.1	0.0	5.2	229.3
02-10-2010 01:50	6.1	904.3	0.0	3.6	225.8
02-10-2010 02:00	6.1	904.3	0.0	4.0	233.0
02-10-2010 02:10	6.1	904.3	0.0	3.5	229.3
02-10-2010 02:20	6.1	904.3	0.0	3.2	224.5
02-10-2010 02:30	6.2	904.3	0.0	3.6	232.8
02-10-2010 02:40	6.2	904.3	0.0	4.3	228.4
02-10-2010 02:50	6.1	904.1	0.0	4.5	215.5
02-10-2010 03:00	6.2	904.0	0.0	3.8	201.1
02-10-2010 03:10	6.2	903.9	0.0	3.3	204.5
02-10-2010 03:20	6.2	903.8	0.0	4.2	212.8
02-10-2010 03:30	6.2	903.8	0.0	4.1	218.3
02-10-2010 03:40	6.2	903.8	0.0	3.9	226.4
02-10-2010 03:50	6.2	903.7	0.0	5.0	218.0

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
02-10-2010 04:00	6.2	903.6	0.0	5.8	227.0
02-10-2010 04:10	6.2	903.5	0.0	5.7	226.9
02-10-2010 04:20	6.2	903.6	0.0	5.2	222.9
02-10-2010 04:30	6.2	903.7	0.0	5.4	225.0
02-10-2010 04:40	6.3	903.7	0.0	4.5	214.5
02-10-2010 04:50	6.3	903.7	0.0	5.2	218.7
02-10-2010 05:00	6.3	903.7	0.0	5.5	225.0
02-10-2010 05:10	6.3	903.7	0.0	5.7	218.7
02-10-2010 05:20	6.3	903.5	0.0	5.8	218.7
02-10-2010 05:30	6.3	903.6	0.0	4.9	220.8

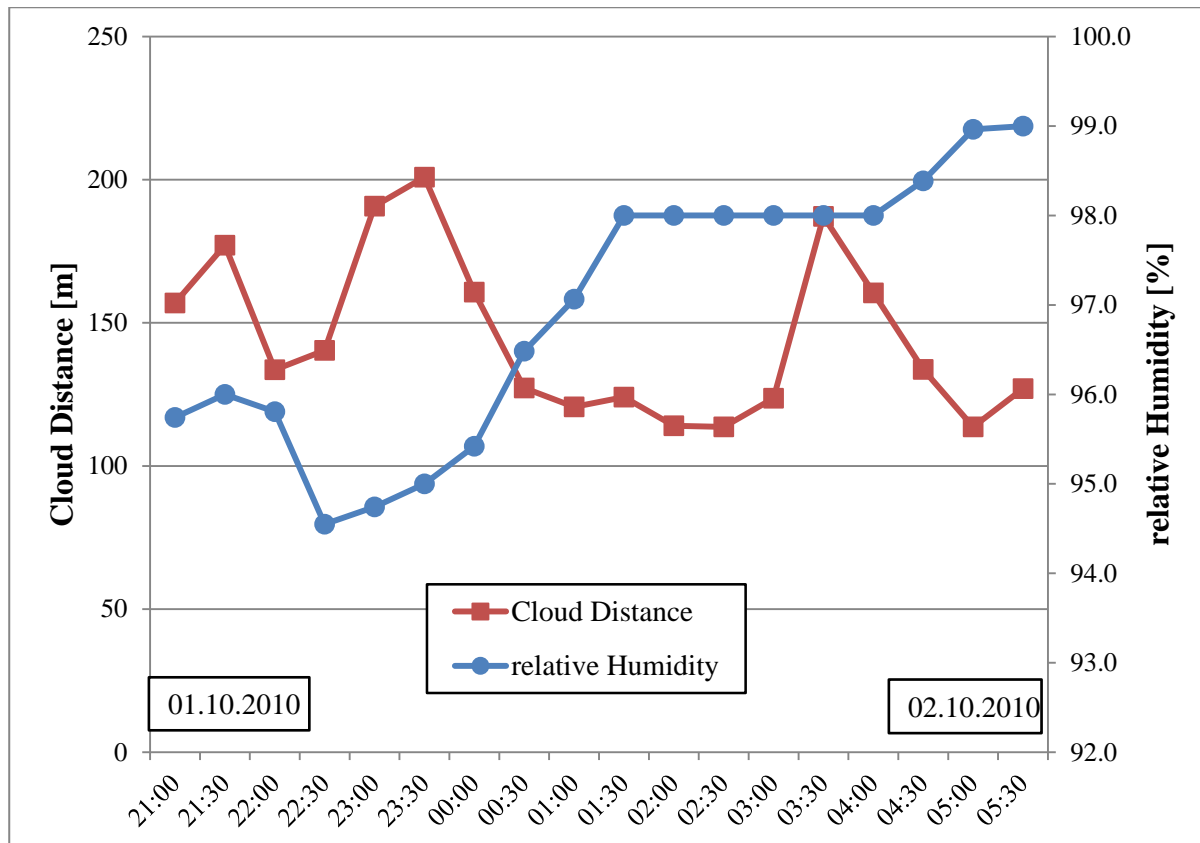


Fig. G 11 Cloud height and relative humidity on cloud event FCE11.2.

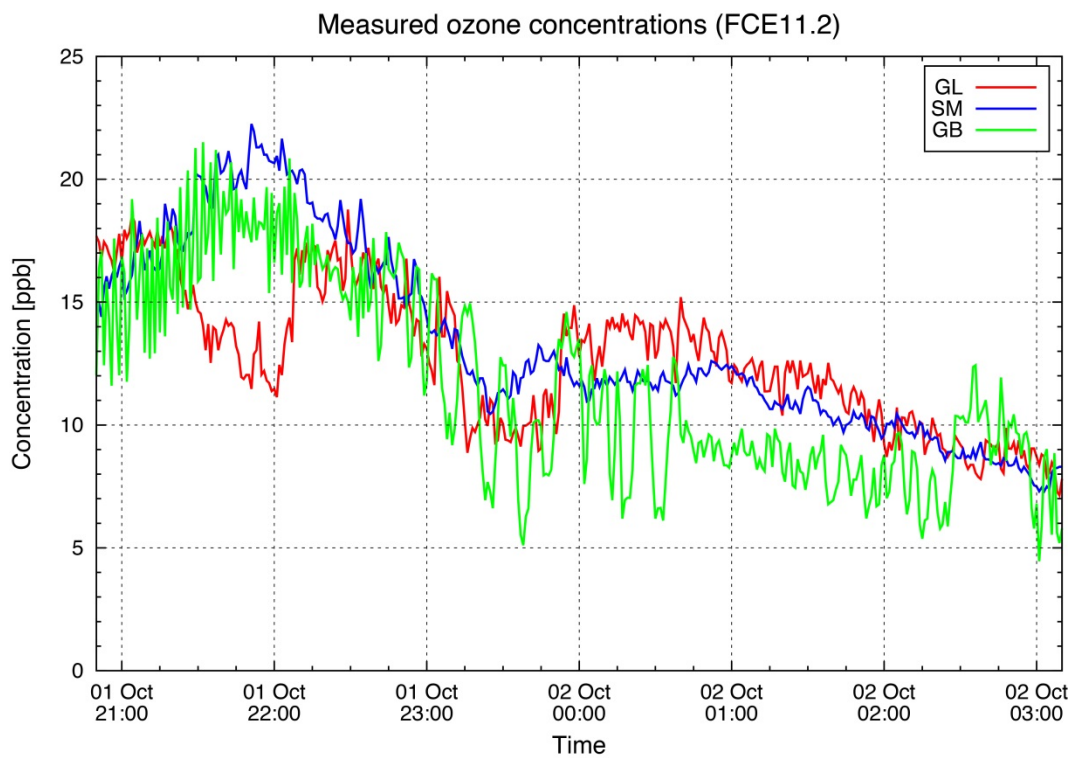


Fig. G 12 Measured ozone concentration over the full event.

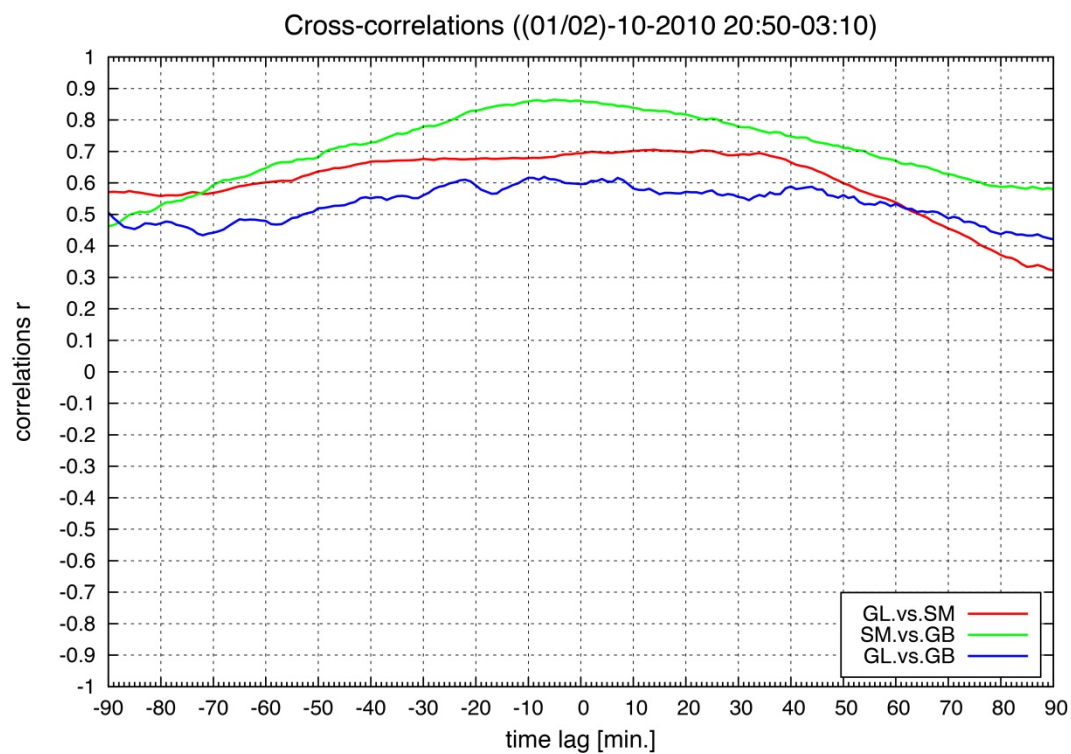


Fig. G 13 Cross-correlation of the full event.

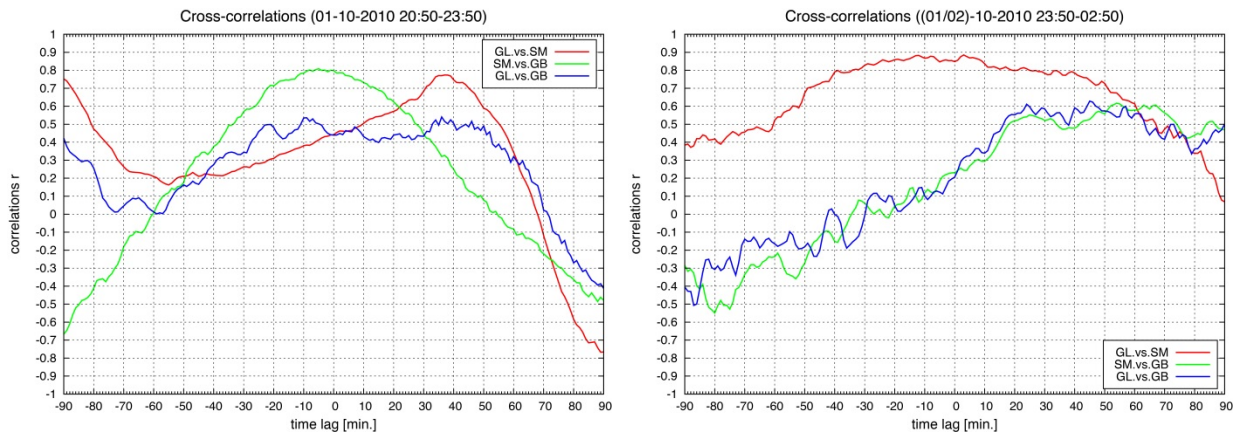


Fig. G 14 Cross-correlation on 24 and 25-09-2010, 20:50 – 23:50 CEST and 23:50 – 02:50 CEST.

H: FCE11.3 (02-03).10.10 07:10 – 00:30 (CEST) (offline sampling 14:30 – 20:00 CEST)

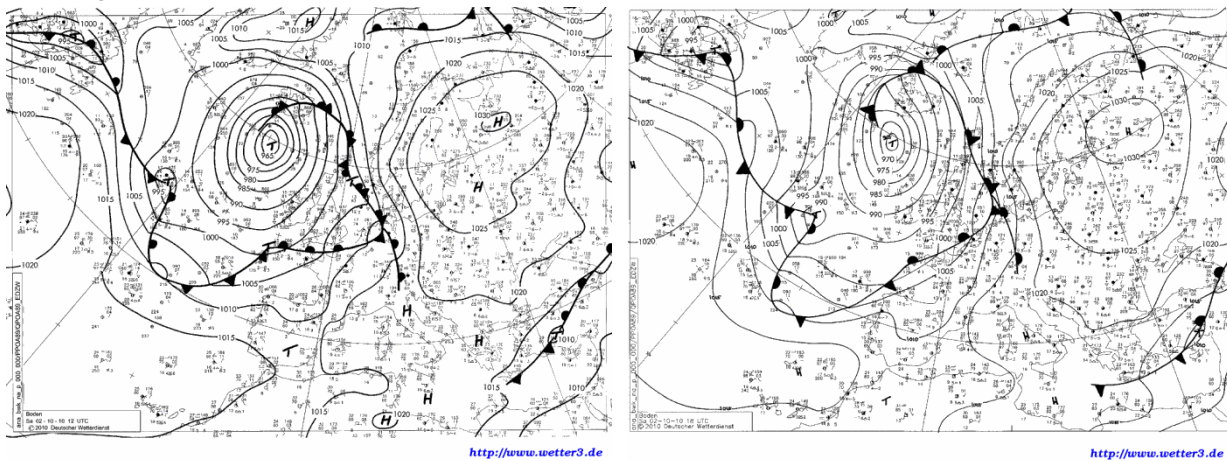


Fig. H 1 Surface weather charts on 02-10-2010, 12 and 18 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

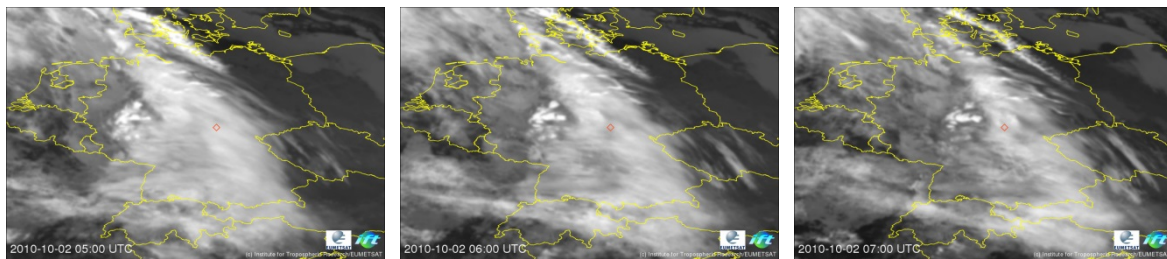


Fig. H 2 IR-satellite picture on 02-10-2010, 05, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

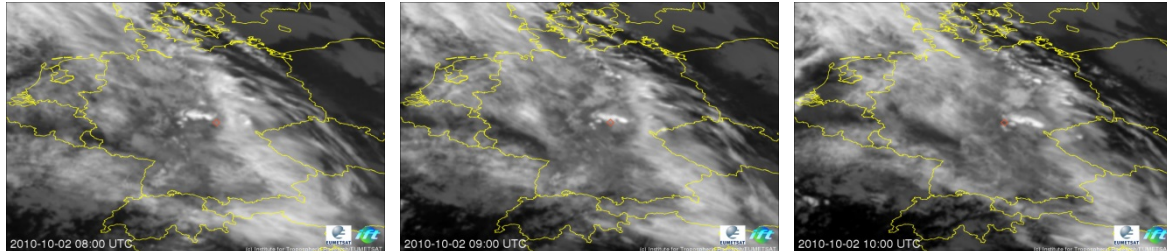


Fig. H 3 IR-satellite picture on 02-10-2010, 08, 09 and 10 UTC (source: ©TROPOS/EUMETSAT).

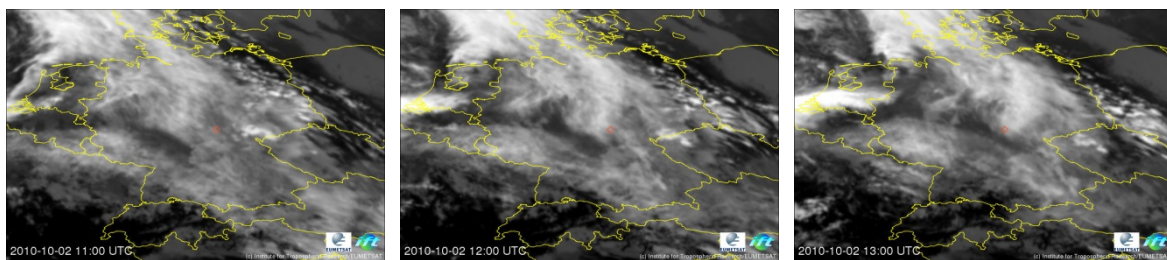


Fig. H 4 IR-satellite picture on 02-10-2010, 11, 12 and 13 UTC (source: ©TROPOS/EUMETSAT).

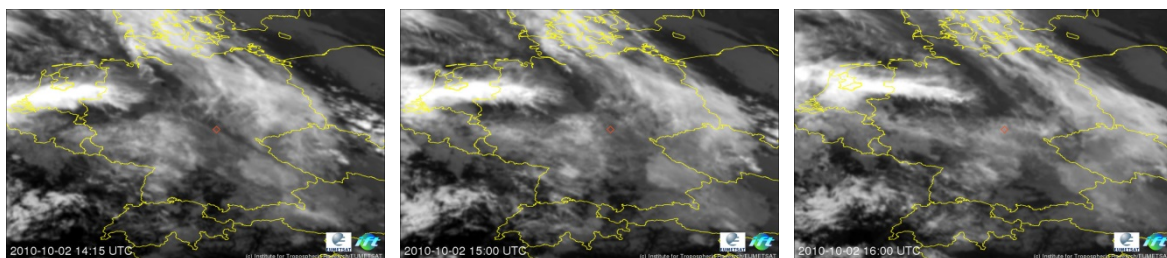


Fig. H 5 IR-satellite picture on 02-10-2010, 14:15, 15 and 16 UTC (source: ©TROPOS/EUMETSAT).

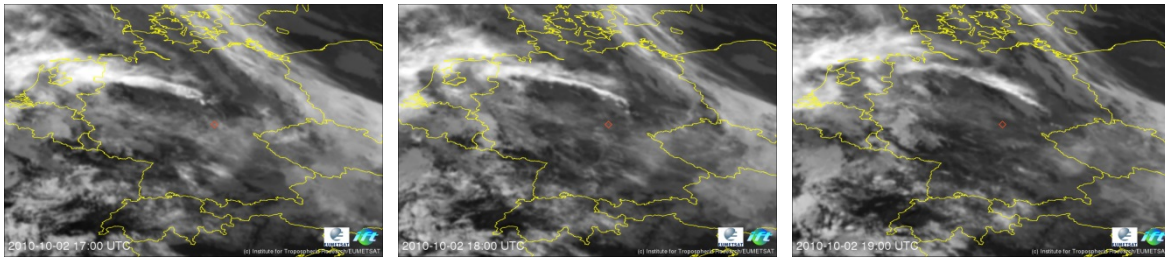


Fig. H 6 IR-satellite picture on 02-10-2010, 17, 18 and 19 UTC (source: ©TROPOS/EUMETSAT).

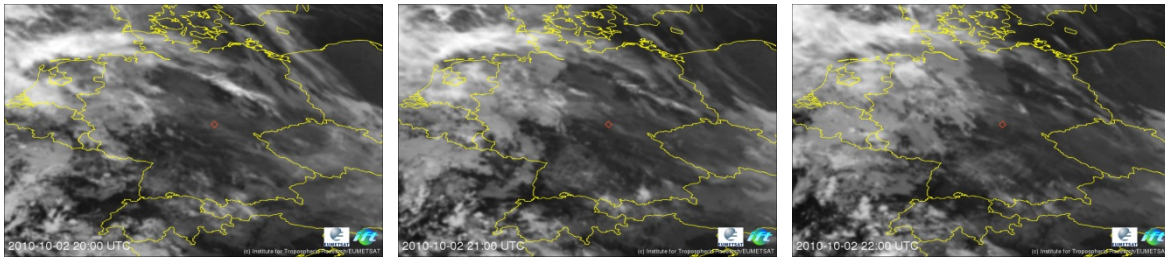


Fig. H 7 IR-satellite picture on 02-10-2010, 20, 21 and 22 UTC (source: ©TROPOS/EUMETSAT).

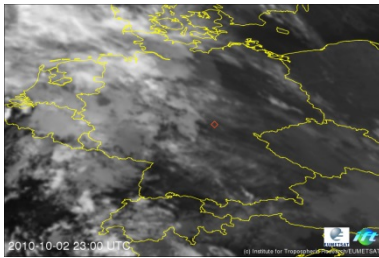


Fig. H 8 IR-satellite picture on 02-10-2010, 23 UTC (source: ©TROPOS/EUMETSAT).



Fig. H 9 VIS-satellite picture on 02-10-2010, 06, 07 and 08 UTC (source: ©TROPOS/EUMETSAT).



Fig. H 10 VIS-satellite picture on 02-10-2010, 09, 10 and 11 UTC (source: ©TROPOS/EUMETSAT).

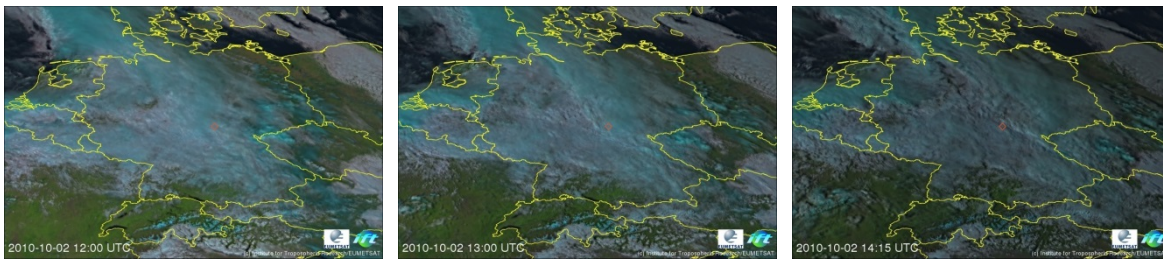


Fig. H 11 VIS-satellite picture on 02-10-2010, 12, 13 and 14:15 UTC (source: ©TROPOS/EUMETSAT).

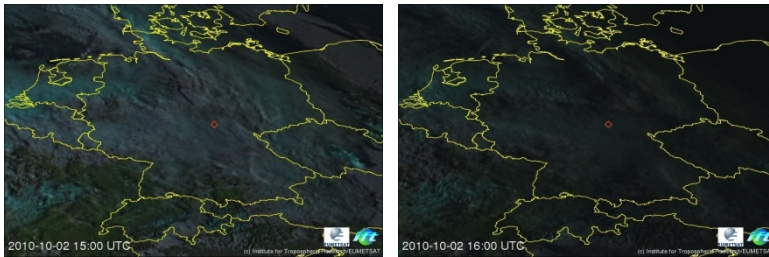


Fig. H 12 VIS-satellite picture on 02-10-2010, 15 and 16 UTC (source: ©TROPOS/EUMETSAT).

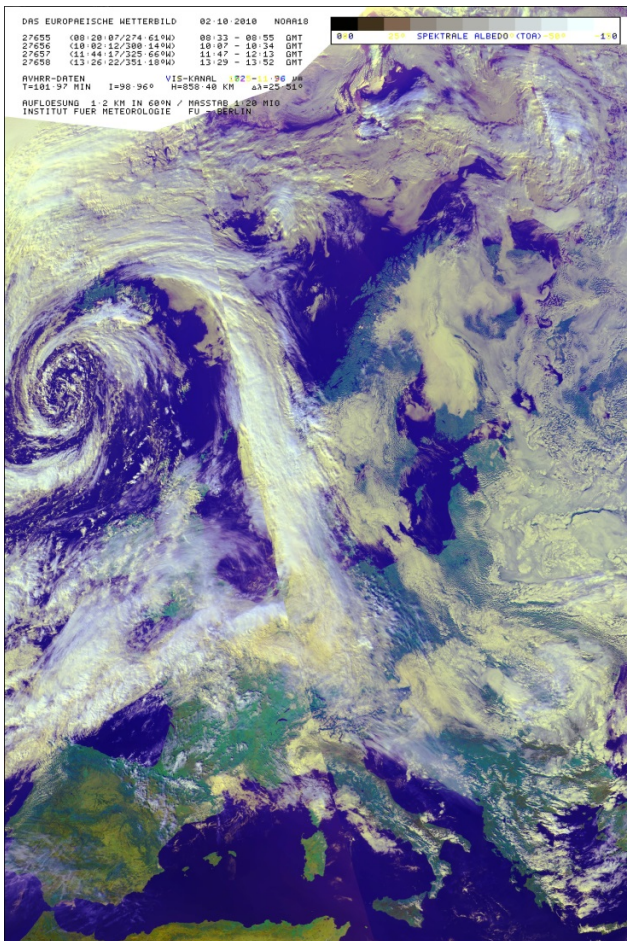


Fig. H 13 NOAA satellite pictures on 02-10-2010 (source: Berliner Wetterkarte e.V., 2010).

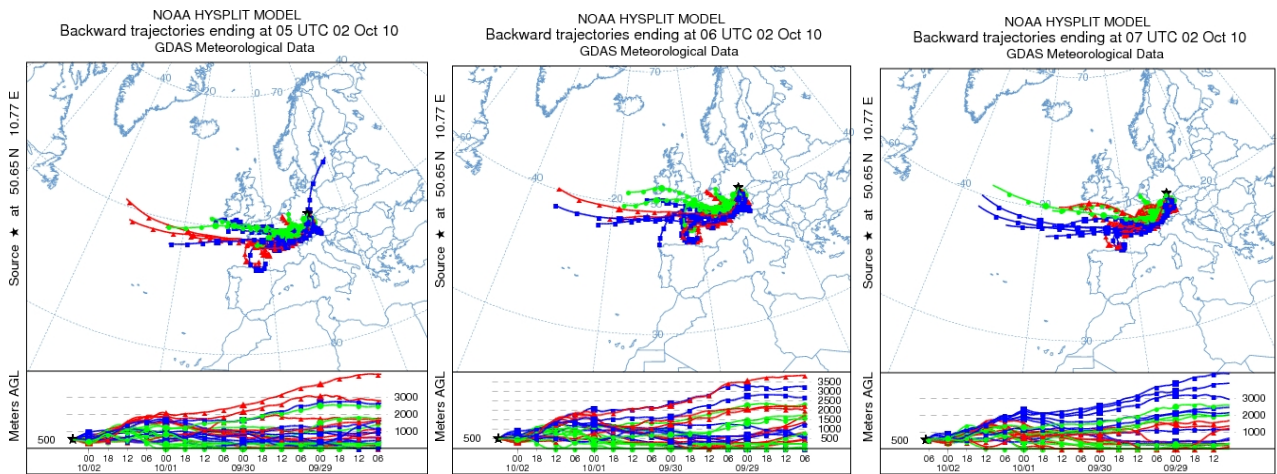


Fig. H 14 Backward trajectories on 02-10-2010, 05; 06 and 07 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

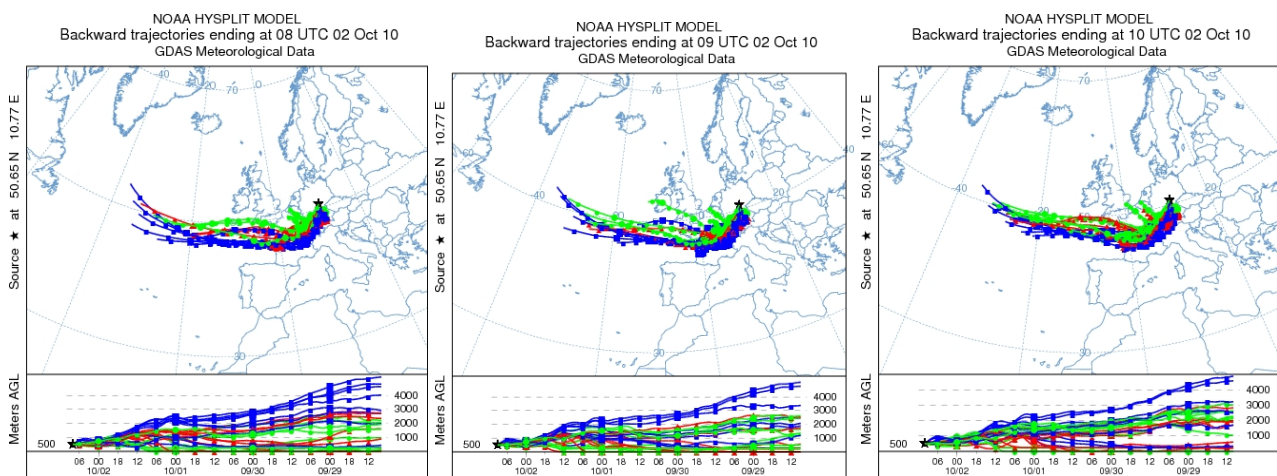


Fig. H 15 Backward trajectories on 02-10-2010, 08; 09 and 10 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

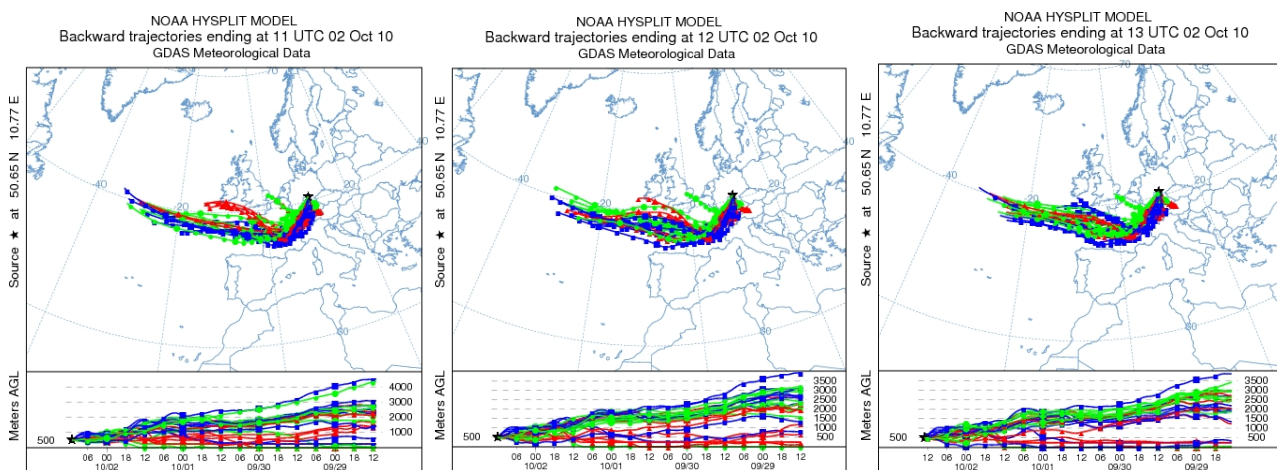


Fig. H 16 Backward trajectories on 02-10-2010, 11; 12 and 13 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

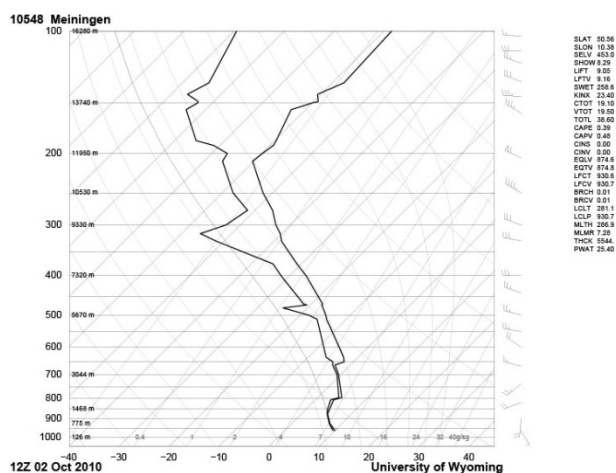


Fig. H 20 Vertical rawinsonde profiles of temperature and dew-point temperature on 02-10-2010, 12 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table H 1 Locally measured meteorological data at the summit station Schmücke on 02/03-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
02-10-2010 07:10	6.0	903.4	0.0	4.5	214.8
02-10-2010 07:20	6.0	903.4	0.0	5.0	217.0
02-10-2010 07:30	6.1	903.5	0.0	5.2	216.4
02-10-2010 07:40	6.1	903.5	0.0	5.9	217.7
02-10-2010 07:50	6.1	903.5	0.0	5.0	216.5
02-10-2010 08:00	6.1	903.6	0.0	5.1	208.3
02-10-2010 08:10	6.1	903.6	0.0	6.3	220.8
02-10-2010 08:20	6.0	903.8	0.0	6.6	220.8
02-10-2010 08:30	5.9	903.8	0.2	5.4	214.5
02-10-2010 08:40	5.9	903.8	0.0	4.7	202.2
02-10-2010 08:50	5.8	903.8	0.0	4.3	198.2
02-10-2010 09:00	5.8	903.8	0.0	4.7	203.0
02-10-2010 09:10	5.8	903.8	0.0	5.0	202.0
02-10-2010 09:20	5.8	903.8	0.2	4.8	210.8
02-10-2010 09:30	5.8	903.8	0.0	4.9	215.4
02-10-2010 09:40	5.8	903.8	0.0	4.8	202.6
02-10-2010 09:50	5.8	903.8	0.0	4.6	207.1
02-10-2010 10:00	5.9	903.8	0.0	4.7	197.7
02-10-2010 10:10	5.9	903.8	0.0	5.3	205.3
02-10-2010 10:20	6.0	903.8	0.0	5.1	210.0
02-10-2010 10:30	6.0	903.9	0.0	5.5	214.3
02-10-2010 10:40	6.0	903.9	0.0	6.1	213.5
02-10-2010 10:50	6.0	904.1	0.0	6.3	206.5
02-10-2010 11:00	6.1	904.2	0.0	6.3	209.3
02-10-2010 11:10	6.1	904.3	0.0	6.6	209.5
02-10-2010 11:20	6.2	904.3	0.0	6.3	221.9
02-10-2010 11:30	6.2	904.3	0.0	6.8	213.5
02-10-2010 11:40	6.2	904.3	0.0	6.6	215.5
02-10-2010 11:50	6.2	904.2	0.0	7.1	225.9

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
02-10-2010 12:00	6.3	904.3	0.0	7.4	223.0
02-10-2010 12:10	6.4	904.3	0.0	7.4	219.1
02-10-2010 12:20	6.4	904.2	0.0	6.9	225.7
02-10-2010 12:30	6.6	904.3	0.0	6.3	231.5
02-10-2010 12:40	6.5	904.3	0.0	7.0	225.6
02-10-2010 12:50	6.6	904.7	0.0	6.8	229.0
02-10-2010 13:00	6.6	904.5	0.0	6.9	217.2
02-10-2010 13:10	6.6	904.4	0.2	7.2	211.4
02-10-2010 13:20	6.6	904.4	0.0	6.2	212.7
02-10-2010 13:30	6.6	904.3	0.0	6.5	219.0
02-10-2010 13:40	6.7	904.3	0.0	6.4	223.8
02-10-2010 13:50	6.8	904.1	0.0	6.6	213.2
02-10-2010 14:00	6.8	904.0	0.0	6.7	222.9
02-10-2010 14:10	6.8	904.0	0.0	7.2	227.0
02-10-2010 14:20	6.8	904.2	0.0	7.5	224.9
02-10-2010 14:30	6.8	904.3	0.0	7.1	218.7
02-10-2010 14:40	7.0	904.4	0.0	6.7	218.7
02-10-2010 14:50	7.1	904.3	0.0	6.9	216.6
02-10-2010 15:00	7.2	904.3	0.0	7.2	218.7
02-10-2010 15:10	7.3	904.3	0.0	7.6	210.4
02-10-2010 15:20	7.4	904.5	0.0	7.7	216.6
02-10-2010 15:30	7.5	904.4	0.0	7.2	216.7
02-10-2010 15:40	7.6	904.3	0.0	6.9	216.6
02-10-2010 15:50	7.7	904.3	0.0	5.5	204.2
02-10-2010 16:00	7.7	904.4	0.0	7.1	214.5
02-10-2010 16:10	7.7	904.4	0.0	8.4	220.7
02-10-2010 16:20	7.7	904.1	0.0	9.0	222.9
02-10-2010 16:30	7.8	904.1	0.0	8.5	222.9
02-10-2010 16:40	7.8	904.1	0.0	7.9	222.9
02-10-2010 16:50	7.8	904.3	0.0	8.5	225.0
02-10-2010 17:00	7.8	904.3	0.0	8.8	225.0
02-10-2010 17:10	7.8	904.3	0.0	8.2	227.0
02-10-2010 17:20	7.8	904.3	0.0	7.0	225.0
02-10-2010 17:30	7.9	904.3	0.0	6.9	225.0
02-10-2010 17:40	8.0	904.3	0.0	6.7	225.0
02-10-2010 17:50	8.0	904.3	0.0	6.3	222.9
02-10-2010 18:00	8.0	904.3	0.0	6.4	225.0
02-10-2010 18:10	8.1	904.3	0.0	6.9	225.0
02-10-2010 18:20	8.0	904.3	0.0	7.4	225.0
02-10-2010 18:30	8.0	904.5	0.0	7.0	225.0
02-10-2010 18:40	8.0	904.7	0.0	7.1	225.0
02-10-2010 18:50	8.0	904.5	0.0	7.6	220.9
02-10-2010 19:00	8.0	904.7	0.0	6.9	225.0
02-10-2010 19:10	8.0	904.8	0.0	6.5	204.5
02-10-2010 19:20	8.1	904.8	0.0	6.5	225.0

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
02-10-2010 19:30	8.1	904.8	0.0	6.5	222.9
02-10-2010 19:40	8.1	904.8	0.0	6.9	222.9
02-10-2010 19:50	8.1	904.9	0.0	6.9	220.8
02-10-2010 20:00	8.1	904.9	0.0	7.1	227.0
02-10-2010 20:10	8.0	904.9	0.0	7.1	225.0
02-10-2010 20:20	8.0	904.9	0.0	6.7	226.9
02-10-2010 20:30	8.1	905.1	0.0	6.3	227.0
02-10-2010 20:40	8.1	905.2	0.0	6.7	232.9
02-10-2010 20:50	8.1	905.1	0.0	6.3	233.9
02-10-2010 21:00	8.1	905.1	0.0	6.1	227.8
02-10-2010 21:10	8.1	905.1	0.0	6.4	231.8
02-10-2010 21:20	8.1	905.3	0.0	6.7	215.4
02-10-2010 21:30	8.1	905.4	0.0	6.2	221.8
02-10-2010 21:40	8.1	905.4	0.0	6.3	227.5
02-10-2010 21:50	8.1	905.4	0.0	6.0	228.9
02-10-2010 22:00	8.1	905.4	0.0	5.7	229.4
02-10-2010 22:10	8.1	905.4	0.0	6.1	230.5
02-10-2010 22:20	8.2	905.3	0.0	5.5	226.2
02-10-2010 22:30	8.2	905.2	0.0	5.5	226.6
02-10-2010 22:40	8.2	905.2	0.0	5.3	230.9
02-10-2010 22:50	8.2	905.1	0.0	5.4	219.6
02-10-2010 23:00	8.3	905.0	0.0	5.0	220.5
02-10-2010 23:10	8.3	905.0	0.0	5.0	212.9
02-10-2010 23:20	8.4	904.9	0.0	4.1	208.7
02-10-2010 23:30	8.4	904.8	0.0	3.9	221.5
02-10-2010 23:40	8.5	904.8	0.0	5.6	223.2
02-10-2010 23:50	8.6	904.8	0.0	5.5	226.0
03-10-2010 00:00	8.6	904.8	0.0	6.1	225.5
03-10-2010 00:10	8.5	904.8	0.0	6.9	221.2
03-10-2010 00:20	8.4	905.0	0.0	6.6	224.6
03-10-2010 00:30	8.5	904.9	0.0	5.6	228.5

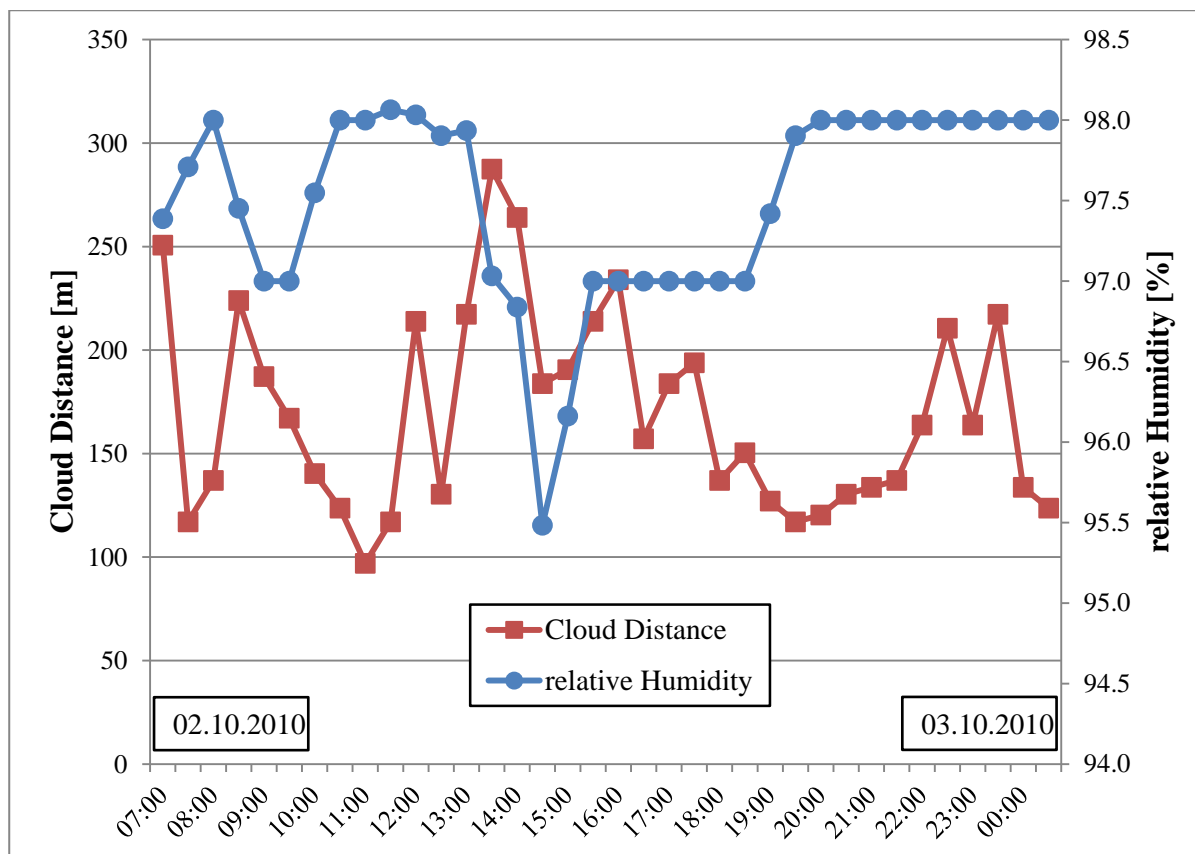


Fig. H 21 Cloud height and relative humidity on cloud event FCE11.3.

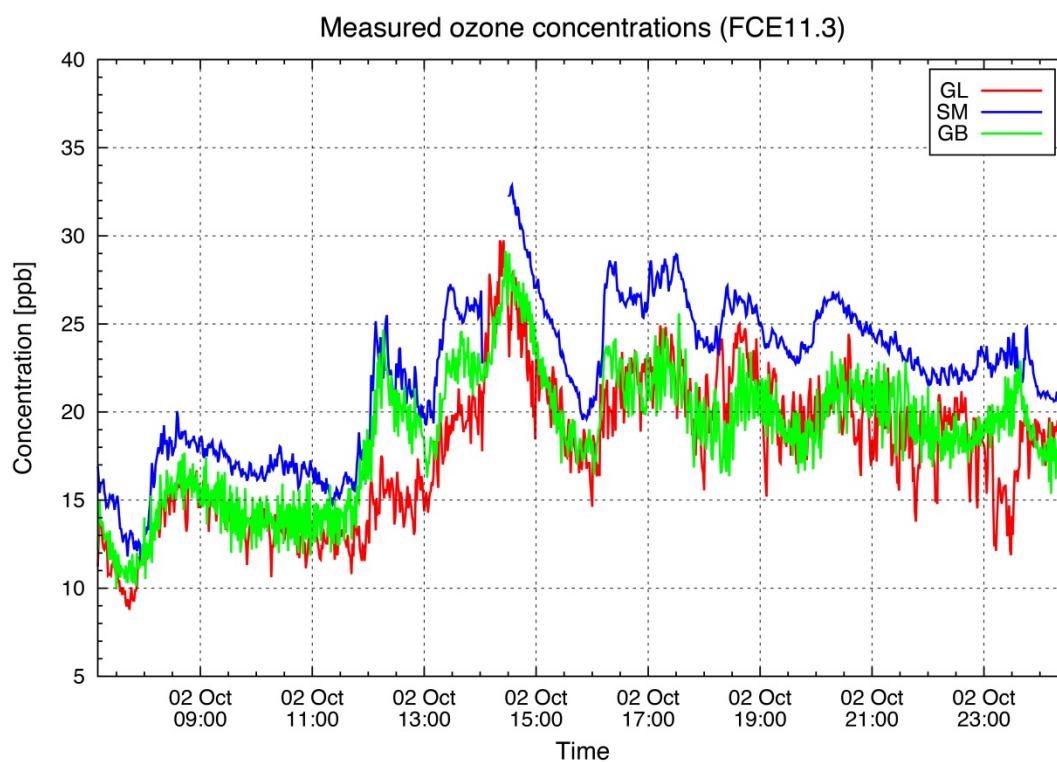


Fig. H 22 Measured ozone concentration over the full event.

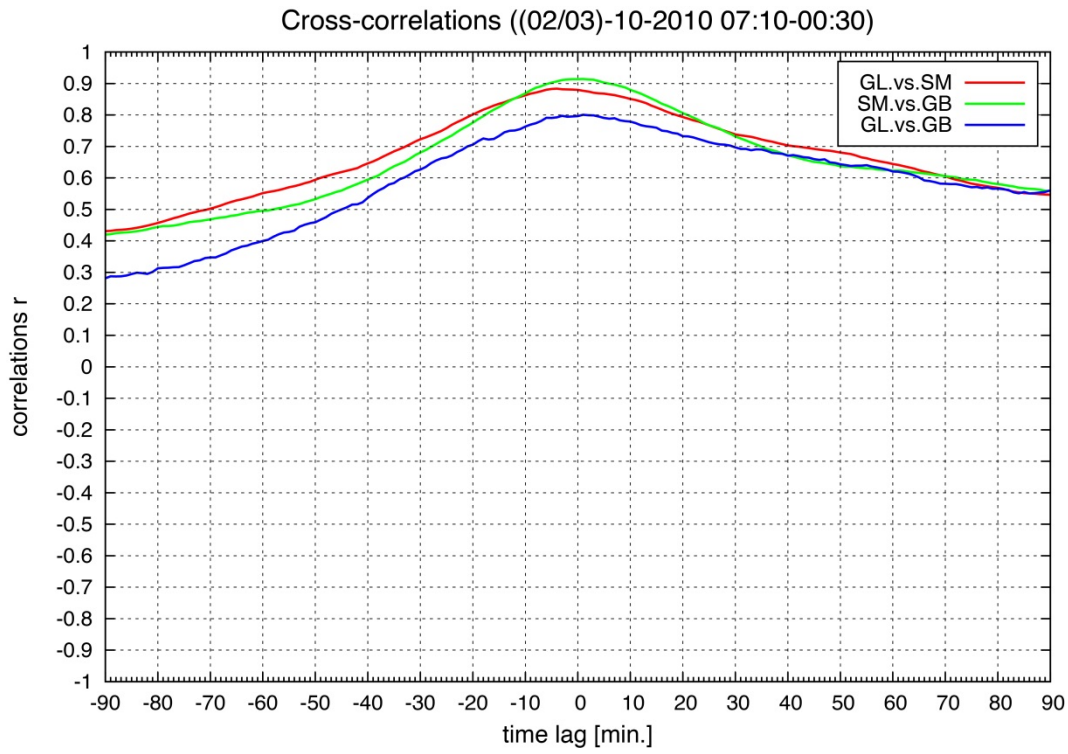


Fig. H 23 Cross-correlation of the full event.

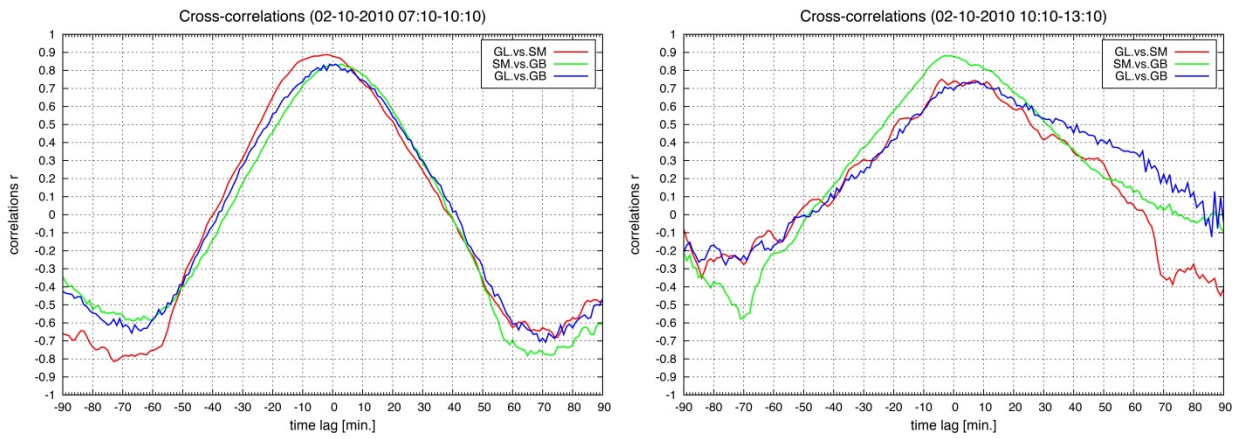


Fig. H 24 Cross-correlation on 02-10-2010, 07:10 – 10:10 CEST and 10:10 – 13:10 CEST.

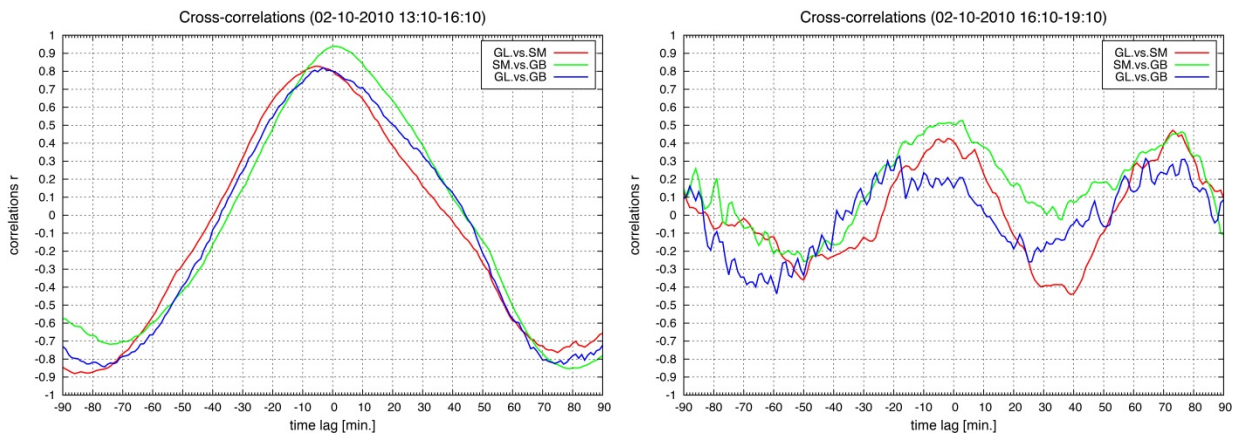


Fig. H 25 Cross-correlation on 02-10-2010, 13:10 – 16:10 CEST and 16:10 – 19:10 CEST.

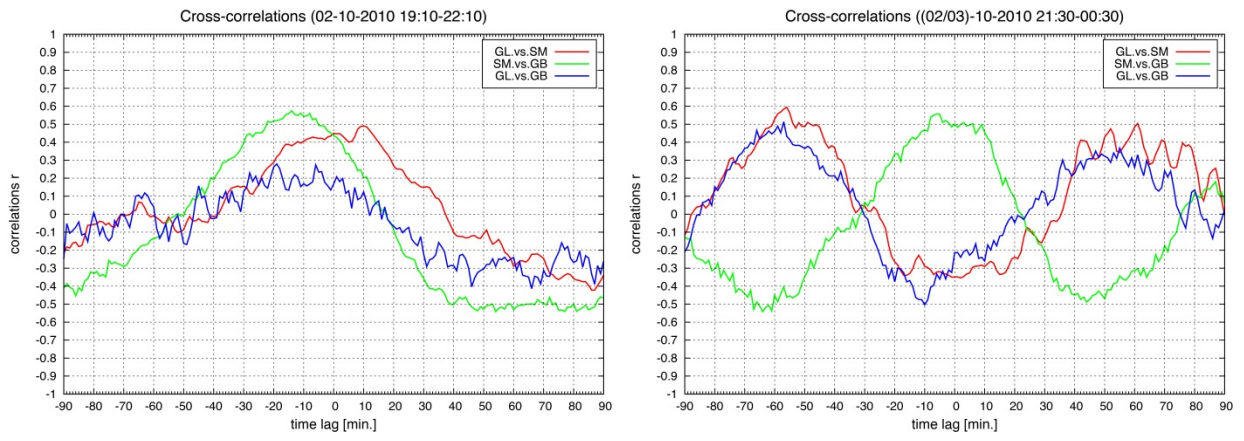


Fig. H 26 Cross-correlation on 02 and 03-10-2010, 19:10 – 22:10 CEST and 21:30 – 00:30 CEST.

I: FCE13.3 (06-07).10.10 06:50 – 03:15 (CEST) (offline sampling 12:15 – 03:15 CEST)

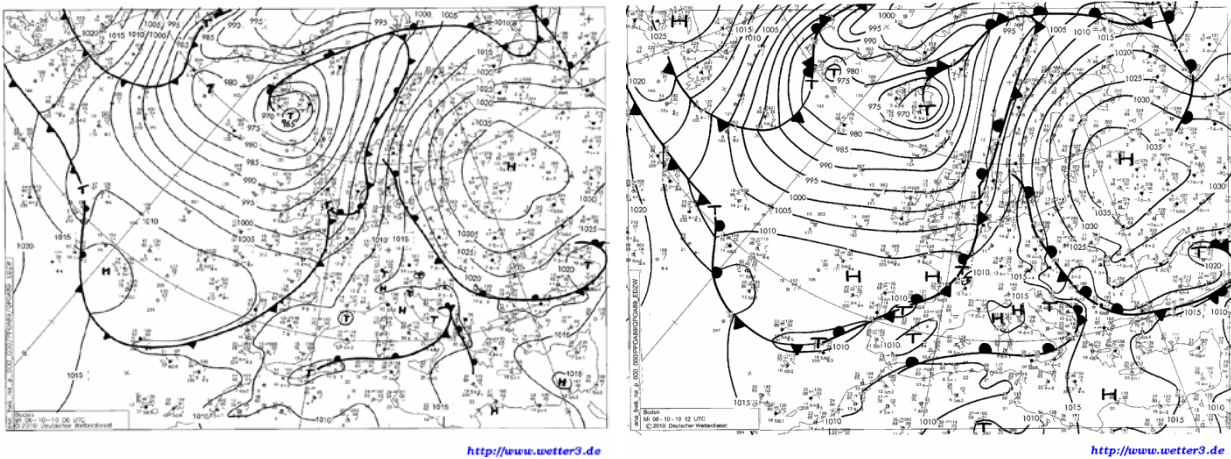


Fig. I 1 Surface weather charts on 06-10-2010, 06 and 12 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

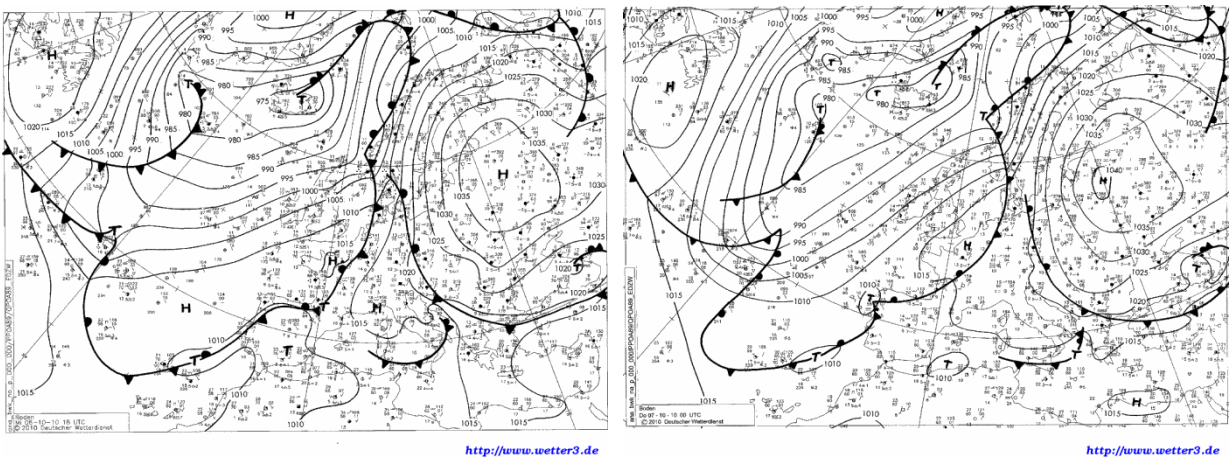


Fig. I 2 Surface weather charts on 06-10-2010, 18 and 07 October, 00 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

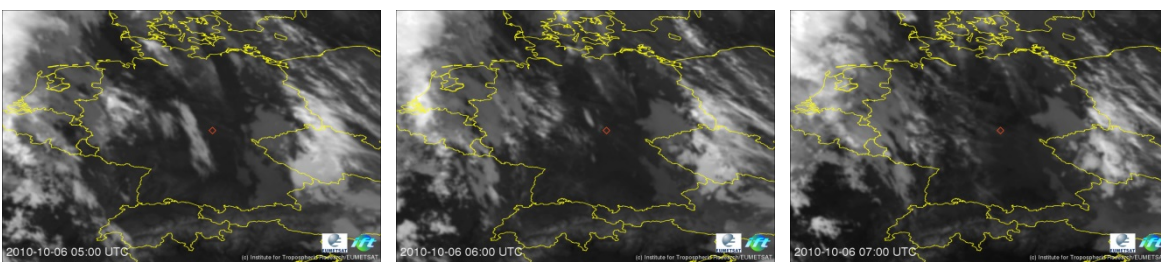


Fig. I 3 IR-satellite picture on 06-10-2010, 05, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

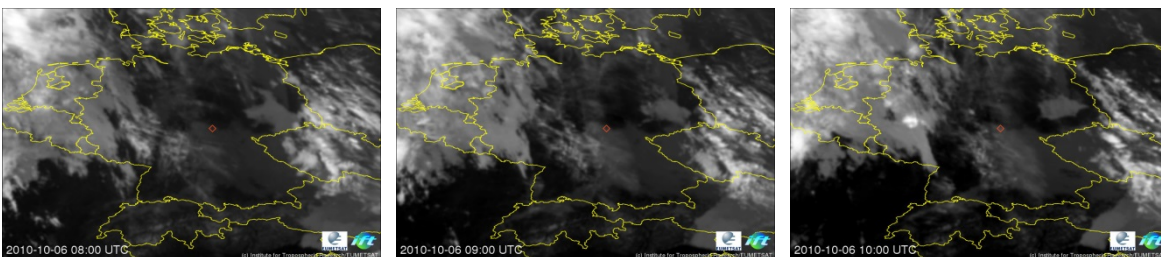


Fig. I 4 IR-satellite picture on 06-10-2010, 08, 09 and 10 UTC (source: ©TROPOS/EUMETSAT).

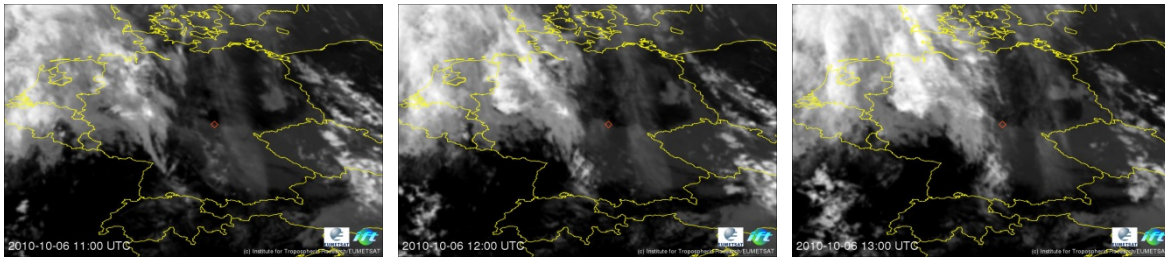


Fig. I 5 IR-satellite picture on 06-10-2010, 11, 12 and 13 UTC (source: ©TROPOS/EUMETSAT).

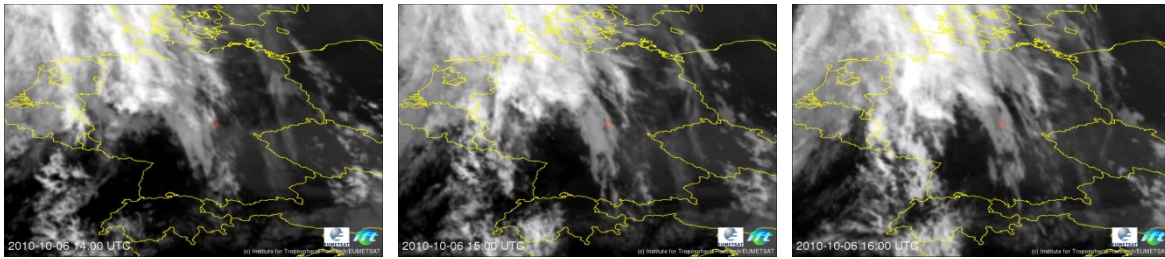


Fig. I 6 IR-satellite picture on 06-10-2010, 14, 15 and 16 UTC (source: ©TROPOS/EUMETSAT).

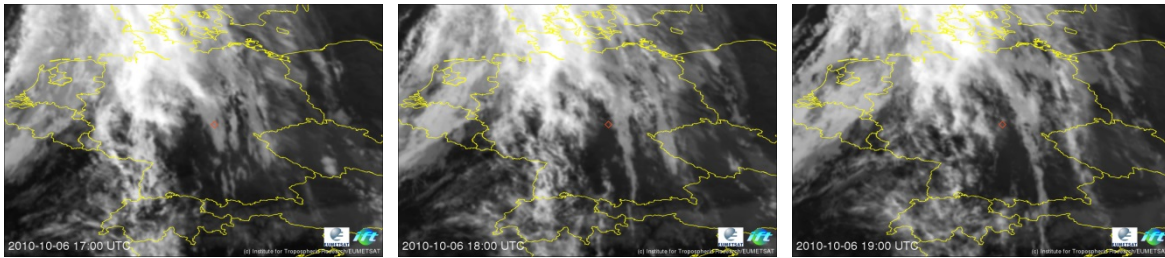


Fig. I 7 IR-satellite picture on 06-10-2010, 17, 18 and 19 UTC (source: ©TROPOS/EUMETSAT).



Fig. I 8 IR-satellite picture on 06-10-2010, 20, 21 and 22 UTC (source: ©TROPOS/EUMETSAT).



Fig. I 9 IR-satellite picture on 06-10-2010, 23 and 07-10-2010, 00 and 01 UTC (source: ©TROPOS/EUMETSAT).



Fig. I 10 VIS-satellite picture on 06-10-2010, 06, 07 and 08 UTC (source: ©TROPOS/EUMETSAT).



Fig. I 11 VIS-satellite picture on 06-10-2010, 09, 10 and 11 UTC (source: ©TROPOS/EUMETSAT).



Fig. I 12 VIS-satellite picture on 06-10-2010, 12, 13 and 14 UTC (source: ©TROPOS/EUMETSAT).

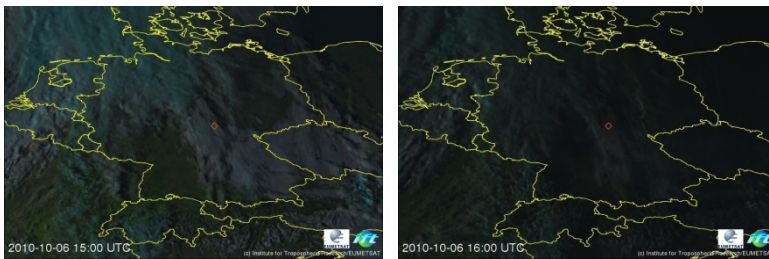


Fig. I 13 VIS-satellite picture on 06-10-2010, 15 and 16 UTC (source: ©TROPOS/EUMETSAT).

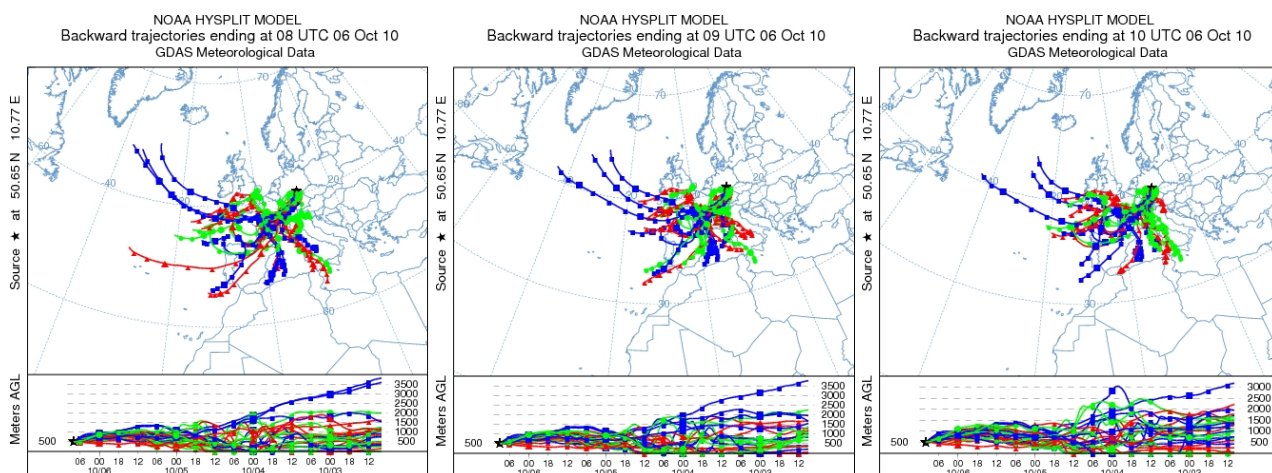


Fig. I 16 Backward trajectories on 06-10-2010, 08, 09 and 10 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

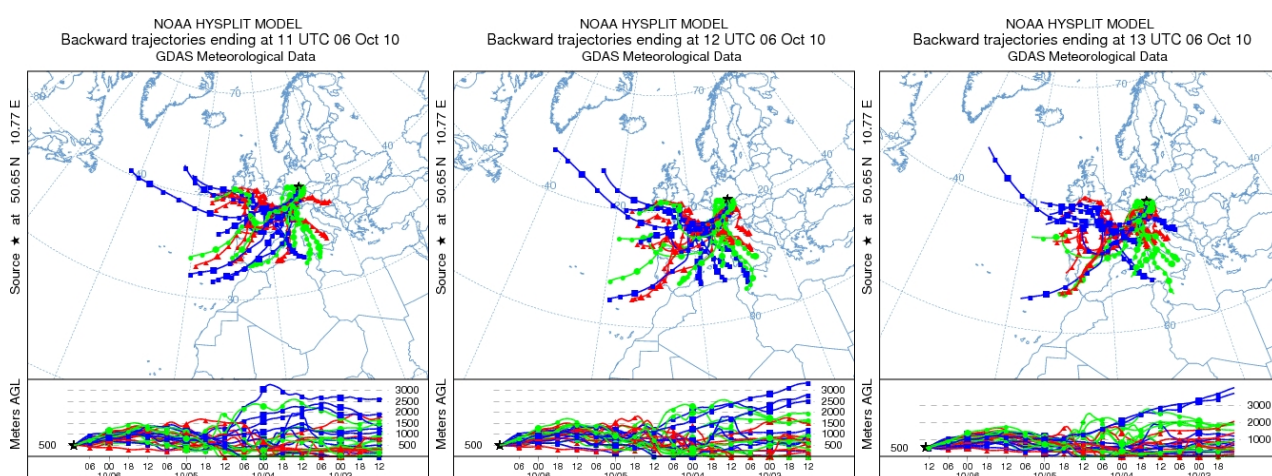


Fig. I 17 Backward trajectories on 06-10-2010, 11, 12 and 13 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

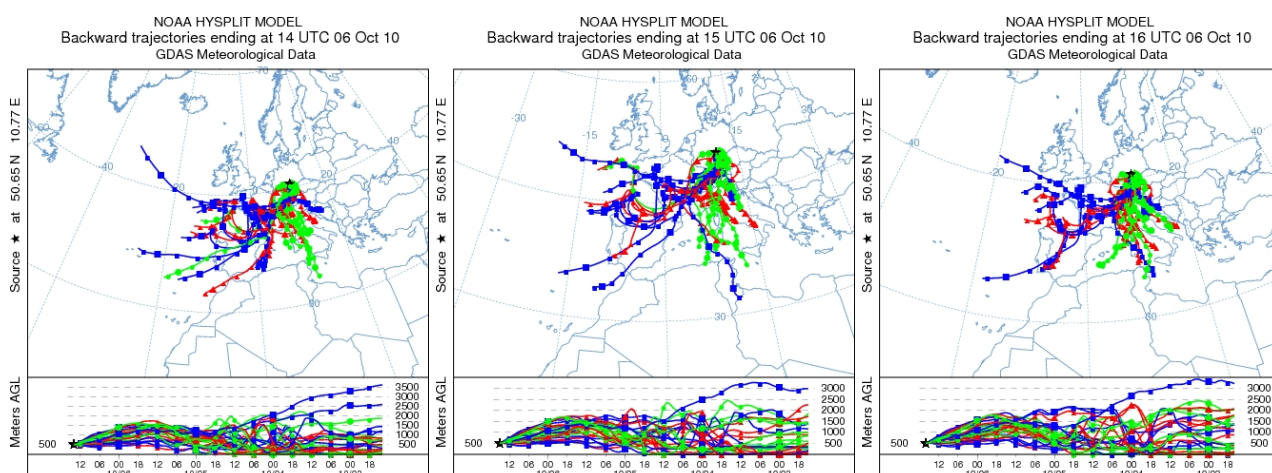


Fig. I 18 Backward trajectories on 06-10-2010, 14, 15 and 16 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

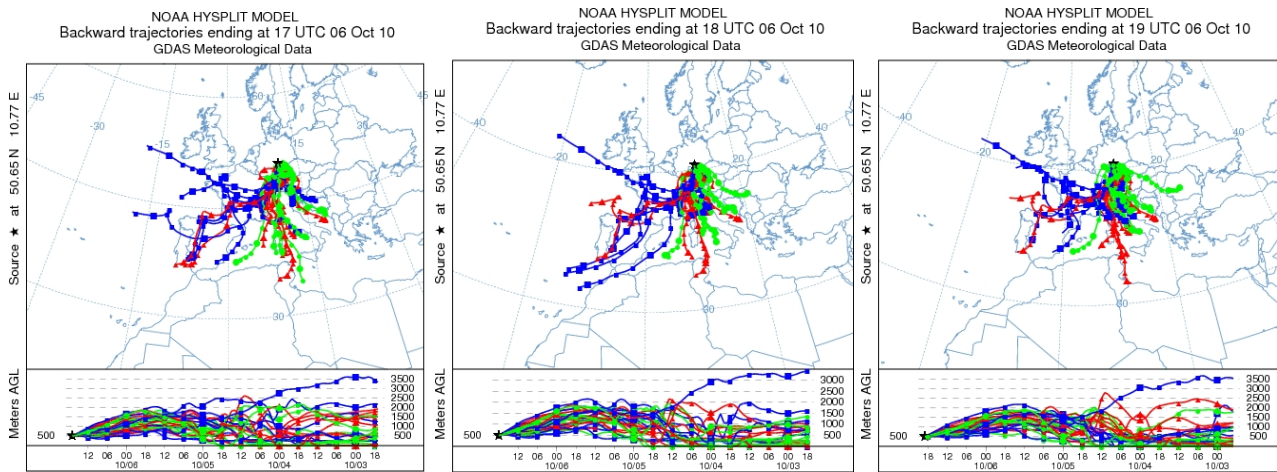


Fig. I 19 Backward trajectories on 06-10-2010, 17, 18 and 19 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

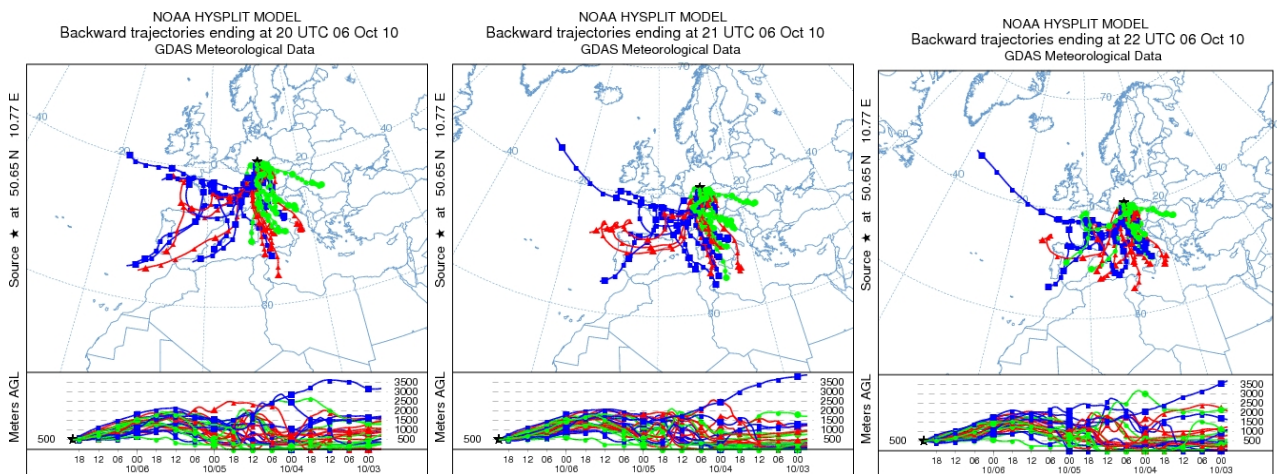


Fig. I 20 Backward trajectories on 06-10-2010, 20, 21 and 22 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

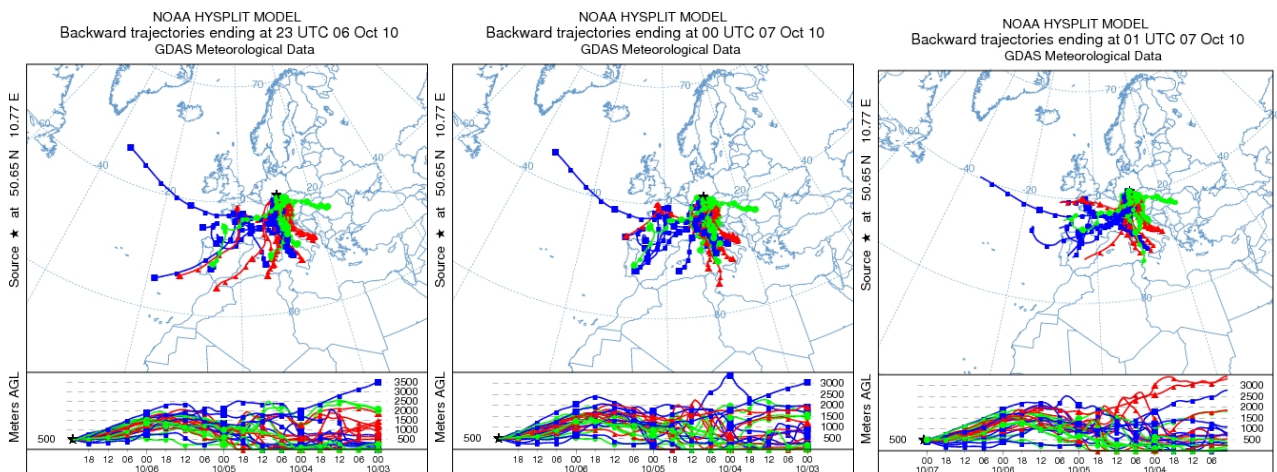


Fig. I 21 Backward trajectories on 06-10-2010, 23, and 07-10-2010, 00 and 01 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

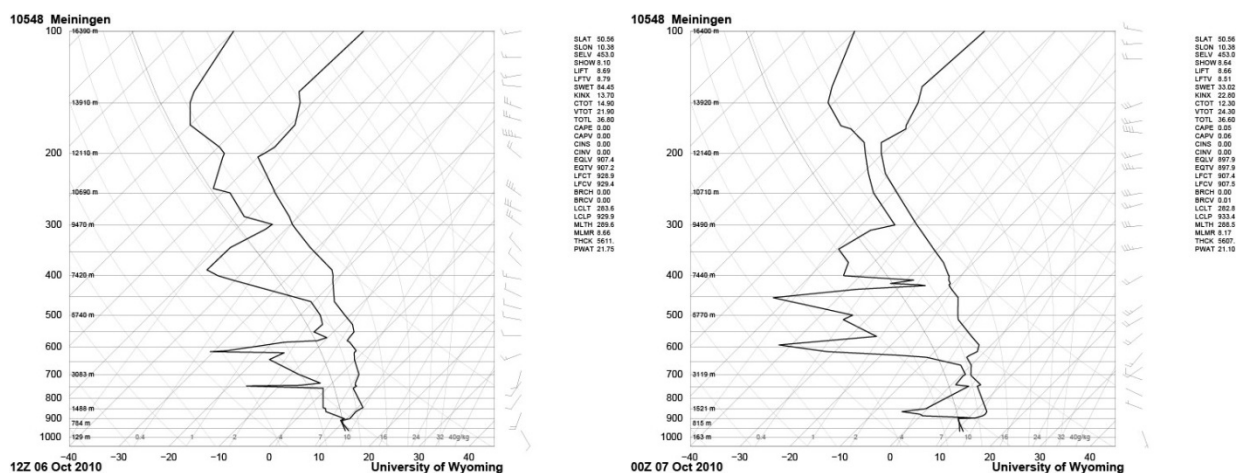


Fig. I 22 Vertical rawinsonde profiles of temperature and dew-point temperature on 06-10-2010, 12 UTC and on 07-10-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table I 1 Locally measured meteorological data at the summit station Schmücke on 06/07-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
06-10-2010 06:50	9.3	903.2	0.0	3.8	213.6
06-10-2010 07:00	9.3	903.3	0.0	4.3	207.8
06-10-2010 07:10	9.4	903.3	0.0	4.5	216.8
06-10-2010 07:20	9.4	903.3	0.0	4.5	221.8
06-10-2010 07:30	9.3	903.4	0.0	4.6	216.2
06-10-2010 07:40	9.3	903.5	0.0	4.8	217.1
06-10-2010 07:50	9.3	903.7	0.0	5.4	220.3
06-10-2010 08:00	9.3	903.8	0.0	5.3	211.9
06-10-2010 08:10	9.3	903.8	0.0	5.4	216.9
06-10-2010 08:20	9.3	903.9	0.0	5.7	217.0
06-10-2010 08:30	9.3	903.9	0.0	4.7	211.8
06-10-2010 08:40	9.3	903.9	0.0	4.1	212.5
06-10-2010 08:50	9.3	903.9	0.0	4.2	211.7
06-10-2010 09:00	9.4	903.9	0.0	3.7	215.4
06-10-2010 09:10	9.4	903.9	0.0	4.2	209.7
06-10-2010 09:20	9.5	904.2	0.0	4.7	217.4
06-10-2010 09:30	9.5	904.3	0.0	4.3	225.4
06-10-2010 09:40	9.5	904.4	0.0	4.7	227.7
06-10-2010 09:50	9.5	904.5	0.0	4.8	227.8
06-10-2010 10:00	9.5	904.5	0.0	4.7	217.9
06-10-2010 10:10	9.6	904.5	0.0	5.0	227.6
06-10-2010 10:20	9.6	904.7	0.0	4.8	228.9
06-10-2010 10:30	9.5	904.7	0.0	5.0	231.0
06-10-2010 10:40	9.5	904.7	0.0	5.7	228.0
06-10-2010 10:50					
06-10-2010 11:00	10.0	904.8	0.0	2.9	205.8
06-10-2010 11:10	10.2	904.8	0.0	3.2	208.0
06-10-2010 11:20	10.5	904.8	0.0	3.0	209.5
06-10-2010 11:30	10.6	904.8	0.0	3.7	225.0

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
06-10-2010 11:40	10.7	904.8	0.0	3.7	215.7
06-10-2010 11:50	10.7	904.8	0.0	3.8	222.7
06-10-2010 12:00	10.7	904.9	0.0	4.0	234.7
06-10-2010 12:10	10.6	904.9	0.0	4.4	237.4
06-10-2010 12:20	10.2	904.9	0.0	4.2	227.7
06-10-2010 12:30	10.0	905.0	0.0	4.2	222.7
06-10-2010 12:40	9.9	905.0	0.0	3.6	221.4
06-10-2010 12:50	10.1	904.9	0.0	3.3	231.1
06-10-2010 13:00	10.1	905.0	0.0	4.4	230.4
06-10-2010 13:10	10.0	905.0	0.0	3.9	230.5
06-10-2010 13:20	10.0	905.1	0.0	4.2	225.9
06-10-2010 13:30	10.2	905.0	0.0	3.2	219.5
06-10-2010 13:40	10.2	904.9	0.0	3.5	205.9
06-10-2010 13:50	10.2	905.1	0.0	3.1	219.8
06-10-2010 14:00	10.3	905.1	0.0	3.6	220.6
06-10-2010 14:10	10.3	905.1	0.0	4.1	221.3
06-10-2010 14:20	10.3	905.2	0.0	4.2	231.3
06-10-2010 14:30	10.2	905.3	0.0	4.9	228.2
06-10-2010 14:40	10.0	905.3	0.0	5.5	235.4
06-10-2010 14:50	9.8	905.3	0.0	5.6	226.5
06-10-2010 15:00	9.7	905.4	0.0	5.4	229.0
06-10-2010 15:10	9.8	905.4	0.0	4.6	222.5
06-10-2010 15:20	9.8	905.4	0.0	4.6	220.6
06-10-2010 15:30	9.8	905.4	0.0	5.2	223.1
06-10-2010 15:40	9.9	905.4	0.0	4.5	213.9
06-10-2010 15:50	9.9	905.4	0.0	4.0	222.0
06-10-2010 16:00	9.9	905.4	0.0	4.5	219.7
06-10-2010 16:10	9.9	905.4	0.0	5.1	216.0
06-10-2010 16:20	9.9	905.7	0.0	4.7	220.5
06-10-2010 16:30	9.9	905.7	0.0	5.1	219.7
06-10-2010 16:40	9.9	905.7	0.0	4.8	217.7
06-10-2010 16:50	9.9	905.8	0.0	4.5	219.1
06-10-2010 17:00	9.9	905.8	0.0	4.1	222.5
06-10-2010 17:10	9.9	905.8	0.0	4.0	214.7
06-10-2010 17:20	9.9	905.8	0.0	3.5	217.3
06-10-2010 17:30	9.9	905.8	0.0	2.8	203.5
06-10-2010 17:40	9.8	905.8	0.0	3.3	222.1
06-10-2010 17:50	9.8	905.8	0.0	4.5	235.0
06-10-2010 18:00	9.8	905.9	0.0	4.8	220.8
06-10-2010 18:10	9.7	905.9	0.0	4.8	226.1
06-10-2010 18:20	9.6	905.9	0.0	4.3	219.9
06-10-2010 18:30	9.5	906.0	0.0	3.4	209.6
06-10-2010 18:40	9.5	906.0	0.0	2.8	206.1
06-10-2010 18:50	9.4	906.3	0.0	2.7	204.1
06-10-2010 19:00	9.4	906.4	0.0	3.6	224.0

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
06-10-2010 19:10	9.3	906.4	0.0	3.0	215.3
06-10-2010 19:20	9.2	906.4	0.0	1.8	194.5
06-10-2010 19:30	9.2	906.4	0.0	1.5	181.3
06-10-2010 19:40	9.2	906.4	0.0	2.9	213.8
06-10-2010 19:50	9.2	906.6	0.0	4.2	227.5
06-10-2010 20:00	9.2	906.7	0.0	3.9	217.7
06-10-2010 20:10	9.2	906.7	0.0	4.5	223.4
06-10-2010 20:20	9.2	906.9	0.0	3.7	226.5
06-10-2010 20:30	9.1	907.0	0.0	4.3	224.5
06-10-2010 20:40	9.0	907.1	0.0	4.3	228.2
06-10-2010 20:50	8.9	907.3	0.0	4.4	229.9
06-10-2010 21:00	8.8	907.4	0.0	4.7	231.1
06-10-2010 21:10	8.8	907.4	0.0	4.5	235.6
06-10-2010 21:20	9.0	907.4	0.0	4.6	21.5
06-10-2010 21:30	9.2	907.5	0.0	5.3	102.8
06-10-2010 21:40	8.7	907.5	0.0	4.9	219.8
06-10-2010 21:50	8.7	907.4	0.0	4.6	224.0
06-10-2010 22:00	8.7	907.5	0.0	3.9	223.2
06-10-2010 22:10	8.7	907.5	0.0	5.0	229.2
06-10-2010 22:20	8.7	907.7	0.0	5.6	228.9
06-10-2010 22:30	8.6	907.8	0.0	5.2	225.0
06-10-2010 22:40	8.5	907.9	0.0	4.8	225.0
06-10-2010 22:50	8.4	908.0	0.0	4.3	225.5
06-10-2010 23:00	8.4	908.0	0.0	3.8	228.7
06-10-2010 23:10	8.3	908.0	0.0	4.7	233.0
06-10-2010 23:20	8.2	908.3	0.0	5.3	235.1
06-10-2010 23:30	8.2	908.2	0.0	5.2	227.2
06-10-2010 23:40	8.2	908.2	0.0	3.4	228.6
06-10-2010 23:50	8.2	908.0	0.0	3.4	234.8
07.10.2010 00:00	8.2	908.0	0.0	4.2	228.7
07.10.2010 00:10	8.0	908.0	0.0	4.2	226.1
07.10.2010 00:20	8.0	908.0	0.0	3.1	229.0
07.10.2010 00:30	8.0	908.1	0.0	2.6	229.5
07.10.2010 00:40	7.9	908.1	0.0	2.8	230.1
07.10.2010 00:50	7.9	908.0	0.0	2.6	232.3
07.10.2010 01:00	7.8	908.1	0.0	2.3	234.6
07.10.2010 01:10	7.8	908.1	0.0	3.1	238.3
07.10.2010 01:20	7.9	908.3	0.0	3.9	237.7
07.10.2010 01:30	7.8	908.4	0.0	4.6	231.7
07.10.2010 01:40	7.8	908.5	0.0	4.6	232.4
07.10.2010 01:50	7.7	908.6	0.0	4.6	235.9
07.10.2010 02:00	7.6	908.5	0.0	3.3	236.4
07.10.2010 02:10	7.5	908.5	0.0	2.4	230.4
07.10.2010 02:20	7.4	908.5	0.0	2.2	233.3
07.10.2010 02:30	7.4	908.5	0.0	1.0	239.5

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
07.10.2010 02:40	7.4	908.5	0.0	1.4	239.2
07.10.2010 02:50	7.5	908.7	0.0	1.7	236.2
07.10.2010 03:00	7.6	908.6	0.0	0.6	244.4
07.10.2010 03:10	8.3	908.6	0.0	1.1	243.5
07.10.2010 03:15	7.8	908.7	0.0	1.5	252.2

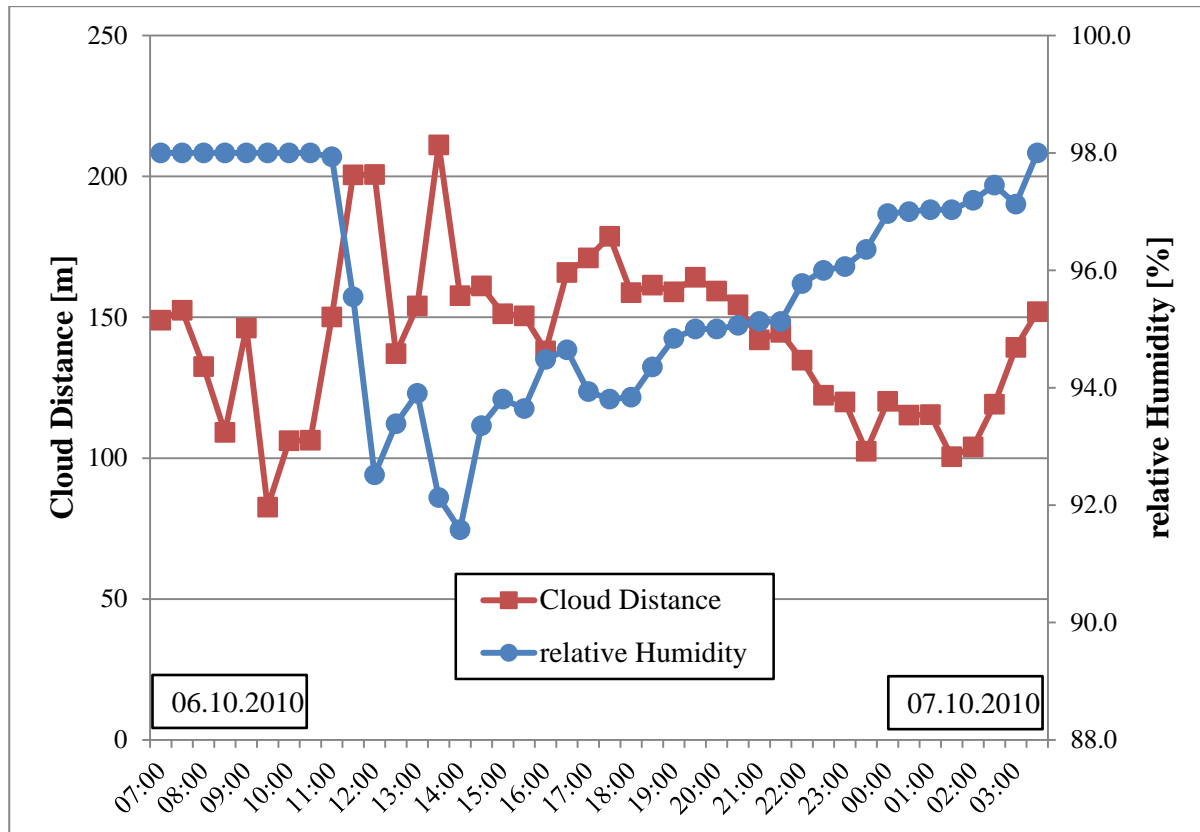


Fig. I 23 Cloud height and relative humidity on cloud event FCE13.3.

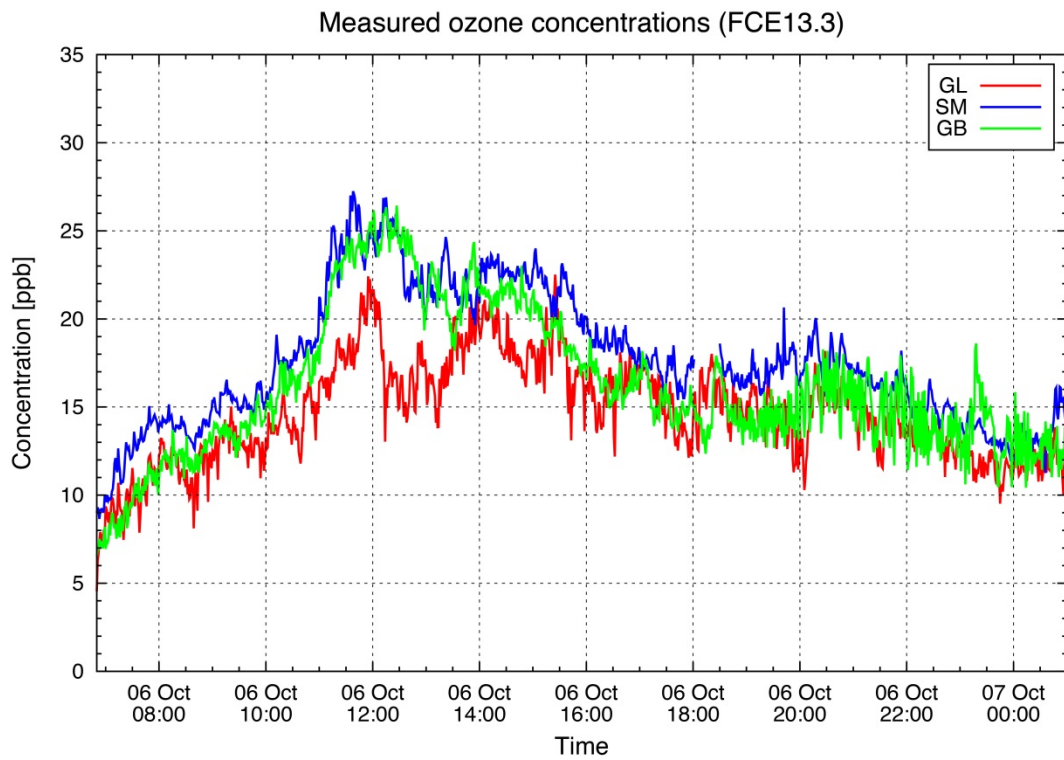


Fig. I 24 Measured ozone concentration over the full event.

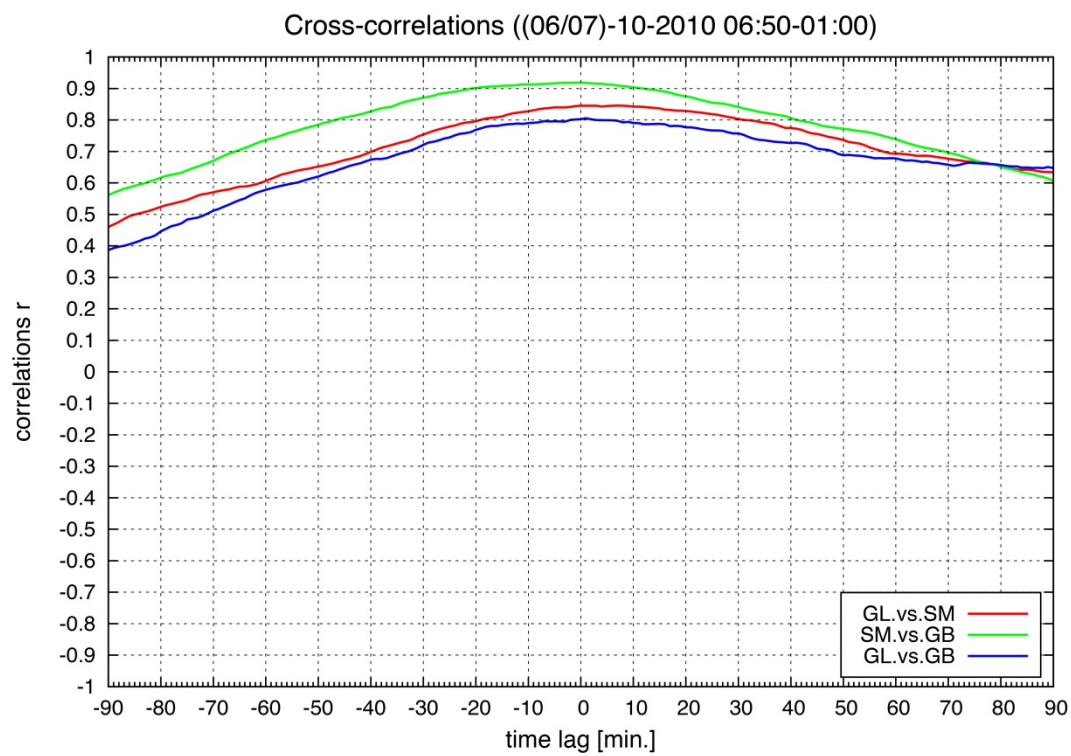


Fig. I 25 Cross-correlation of the full event.

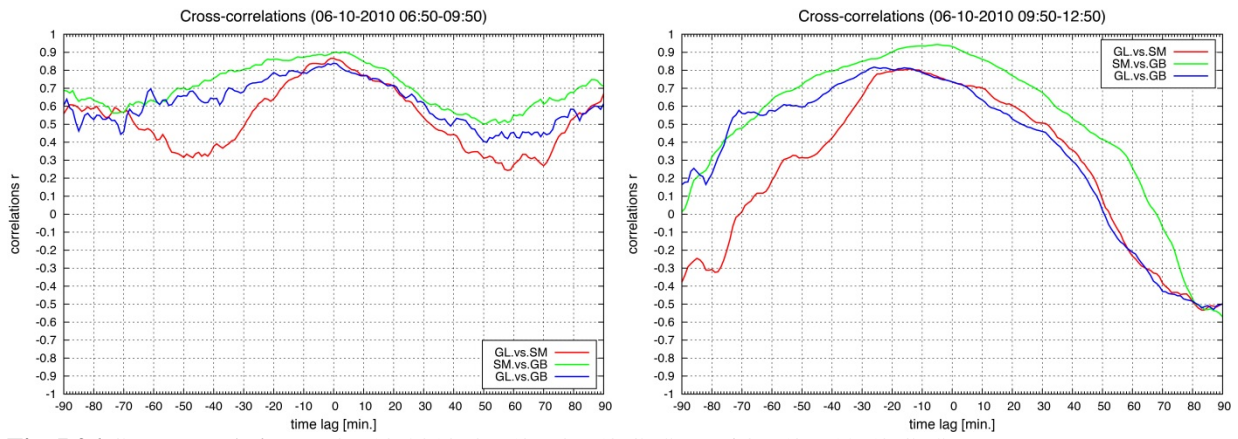


Fig. I 26 Cross-correlation on 06-10-2010, 06:50 – 09:50 CEST and 09:50 – 12:50 CEST.

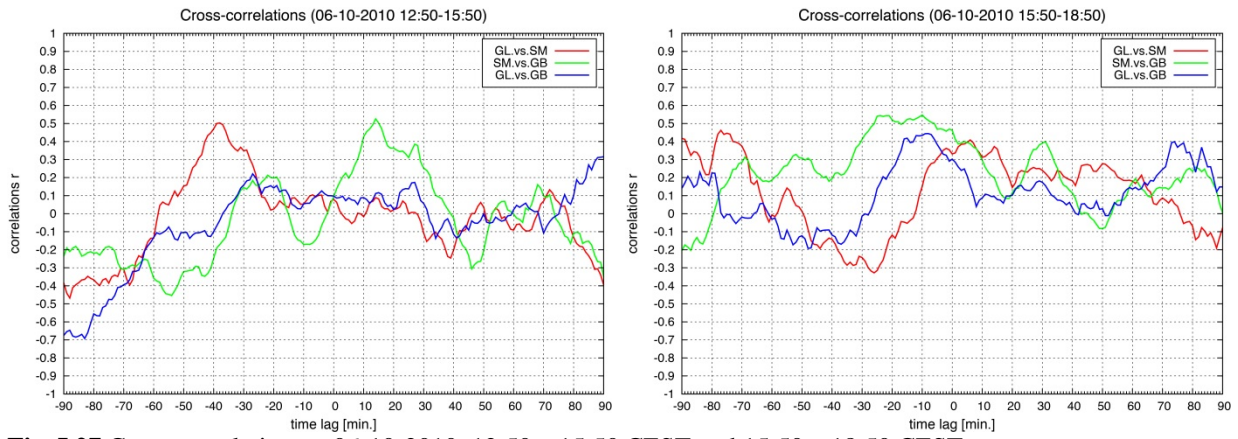


Fig. I 27 Cross-correlation on 06-10-2010, 12:50 – 15:50 CEST and 15:50 – 18:50 CEST.

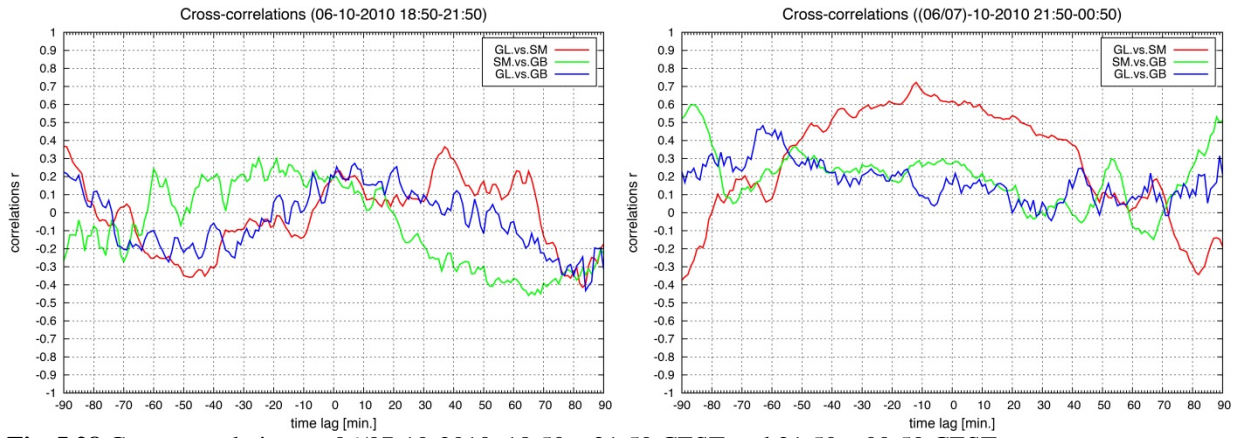


Fig. I 28 Cross-correlation on 06-10-2010, 18:50 – 21:50 CEST and 21:50 – 00:50 CEST.

J: FCE22.0 19.10.10 01:50 – 09:00 (CEST)

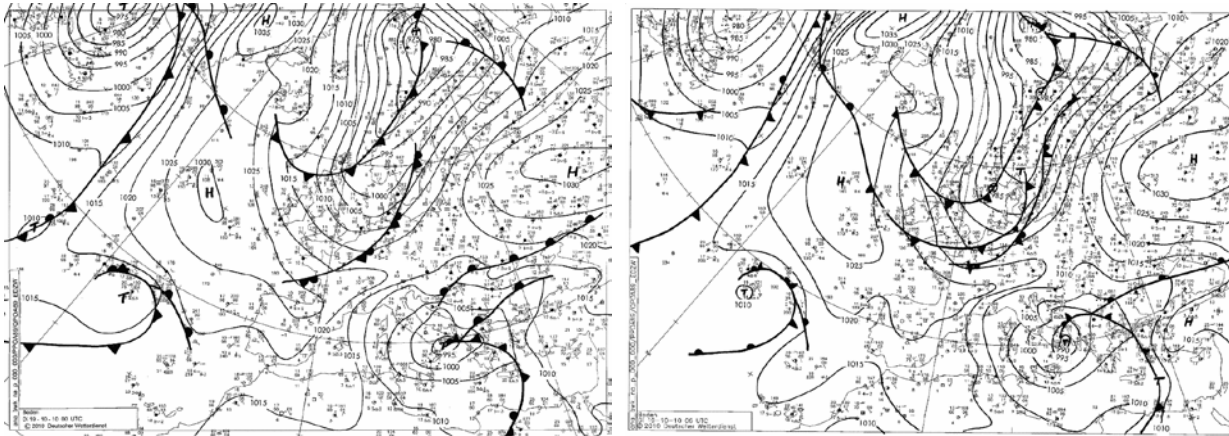


Fig. J 1 Surface weather charts on 19-10-2010, 00 and 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

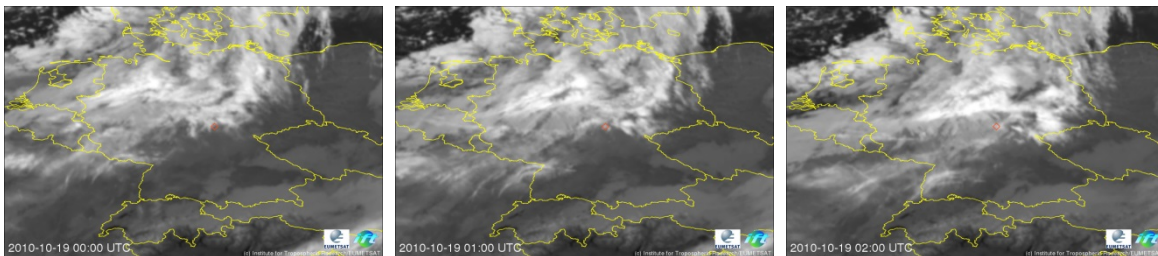


Fig. J 2 IR-satellite picture on 19-10-2010, 00, 01 and 02 UTC (source: ©TROPOS/EUMETSAT).

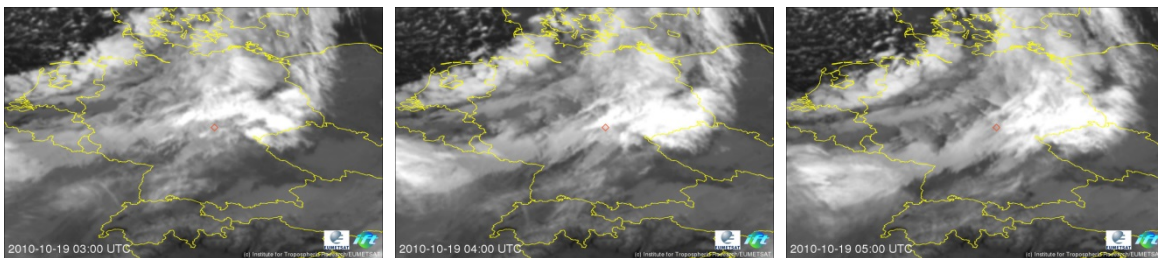


Fig. J 3 IR-satellite picture on 19-10-2010, 03, 04 and 05 UTC (source: ©TROPOS/EUMETSAT).

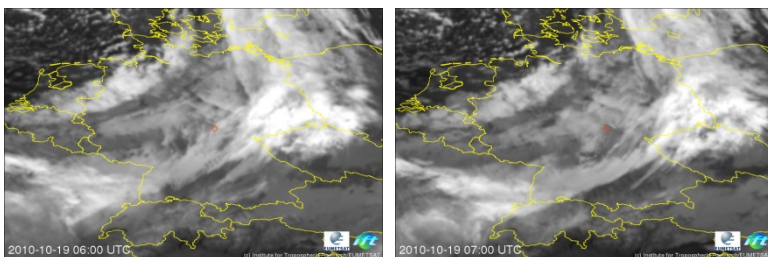


Fig. J 4 IR-satellite picture on 19-10-2010, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

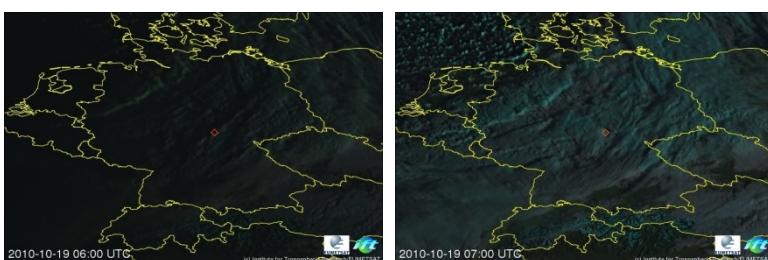


Fig. J 5 VIS-satellite picture on 19-10-2010, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

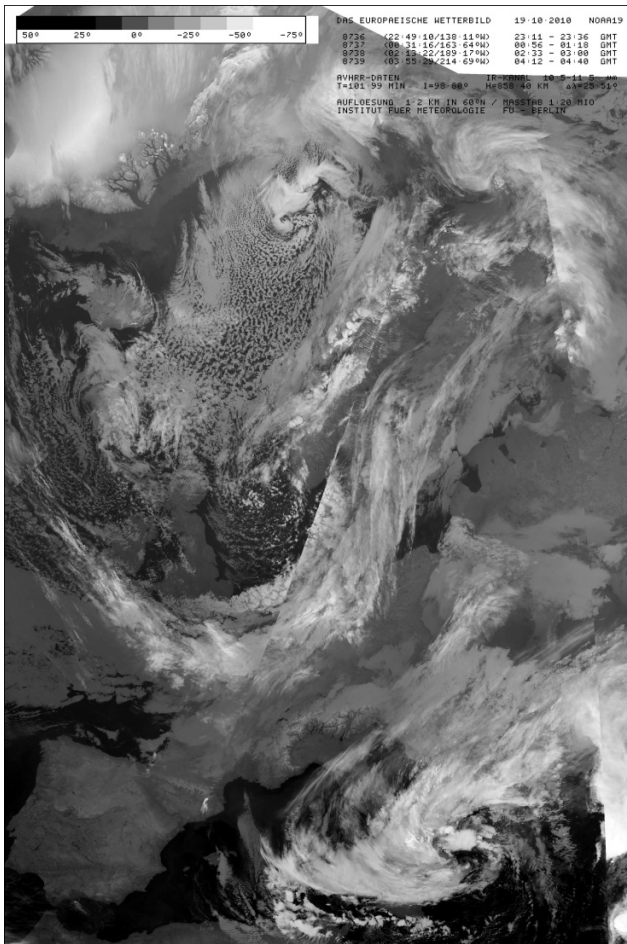


Fig. J 6 NOAA satellite pictures on 19-10-2010 (source: Berliner Wetterkarte e.V., 2010).

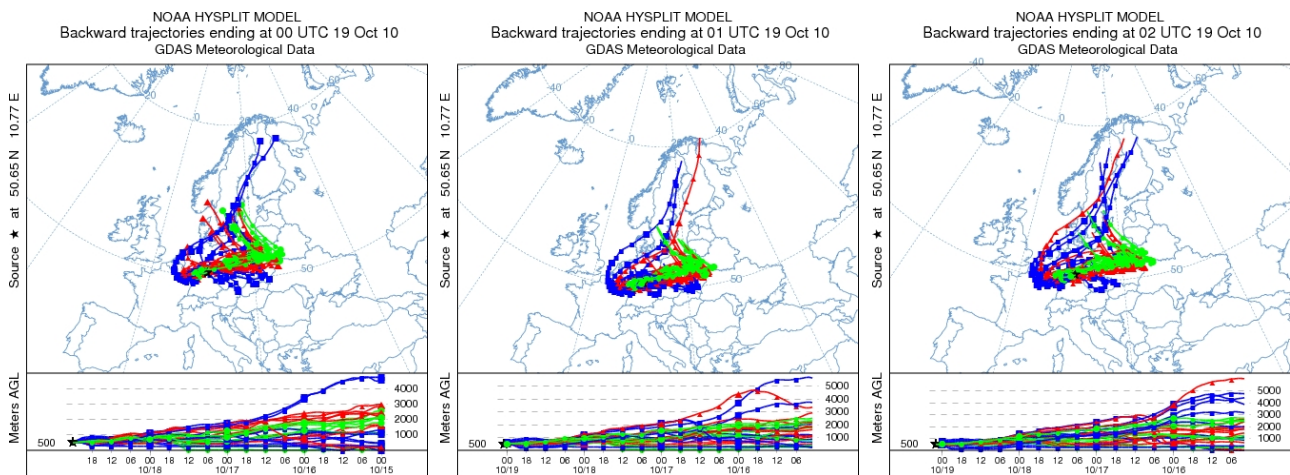


Fig. J 7 Backward trajectories on 19-10-2010, 00, 01 and 02 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

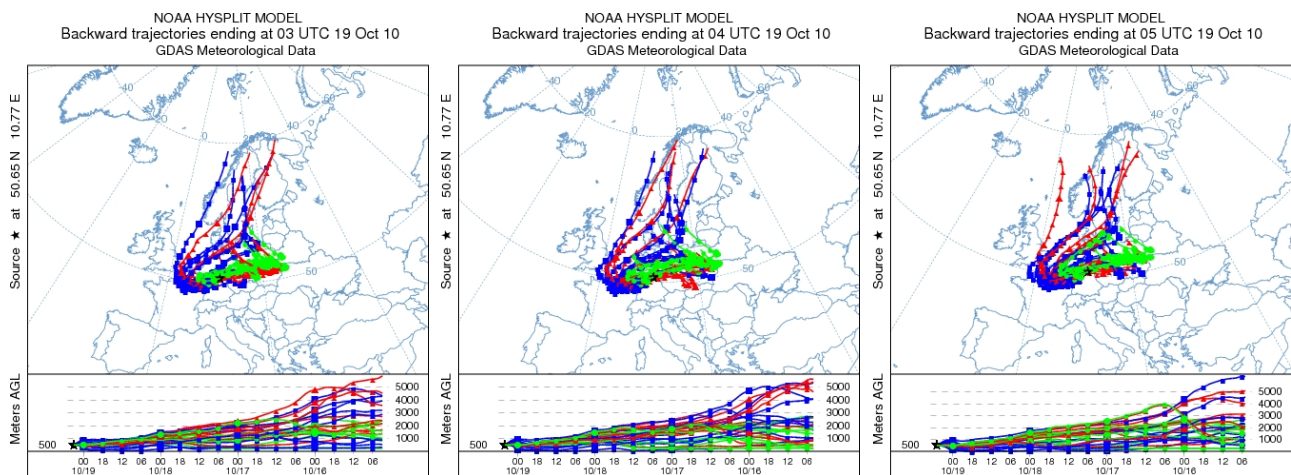


Fig. J 8 Backward trajectories on 19-10-2010, 03, 04 and 05 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

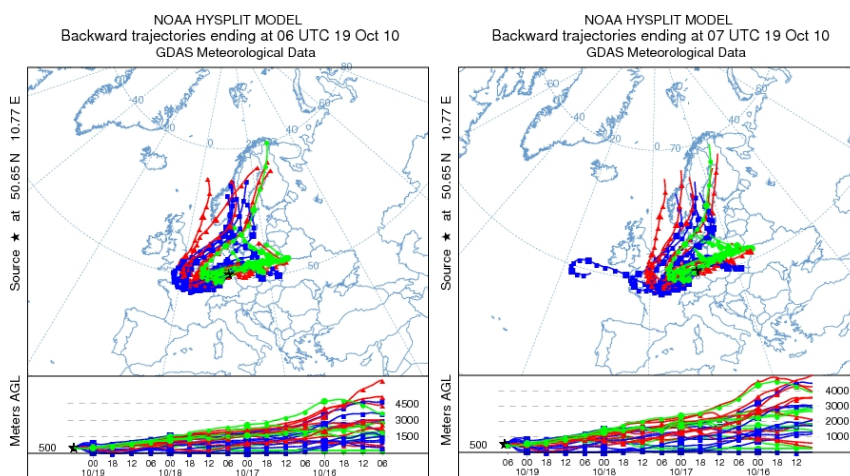


Fig. J 9 Backward trajectories on 19-10-2010, 06 and 07 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

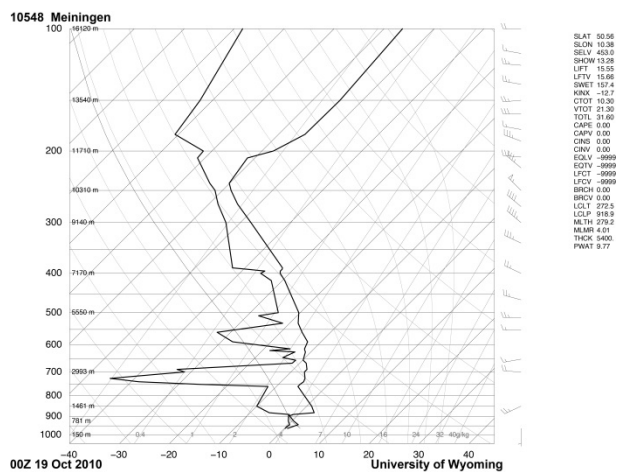


Fig. J 10 Vertical rawinsonde profiles of temperature and dew-point temperature on 19-10-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table J 1 Locally measured meteorological data at the summit station Schmücke on 19-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
19-10-2010 01:50	-1.6	901.8	0.0	7.1	238.8
19-10-2010 02:00	-1.5	901.7	0.0	8.0	229.8
19-10-2010 02:10	-1.4	901.7	0.0	7.5	232.7
19-10-2010 02:20	-1.4	901.3	0.0	7.8	234.2
19-10-2010 02:30	-1.4	901.1	0.0	7.4	231.8
19-10-2010 02:40	-1.4	901.0	0.0	7.8	234.5
19-10-2010 02:50	-1.4	901.1	0.0	7.7	234.4
19-10-2010 03:00	-1.4	901.1	0.0	7.0	235.0
19-10-2010 03:10	-1.4	901.1	0.0	7.3	246.4
19-10-2010 03:20	-1.3	900.8	0.0	7.7	240.3
19-10-2010 03:30	-1.2	900.9	0.0	6.4	231.3
19-10-2010 03:40	-1.1	900.9	0.0	6.5	229.4
19-10-2010 03:50	-1.1	900.8	0.0	6.5	228.2
19-10-2010 04:00	-1.1	900.7	0.0	6.8	227.3
19-10-2010 04:10	-1.1	900.7	0.0	6.9	231.4
19-10-2010 04:20	-1.1	900.2	0.0	7.3	224.2
19-10-2010 04:30	-1.1	900.1	0.0	7.7	223.8
19-10-2010 04:40	-1.2	900.1	0.0	8.3	223.1
19-10-2010 04:50	-1.2	899.7	0.0	7.7	226.5
19-10-2010 05:00	-1.2	899.7	0.0	6.7	216.5
19-10-2010 05:10	-1.2	899.7	0.0	6.5	227.1
19-10-2010 05:20	-1.2	899.6	0.0	6.4	230.2
19-10-2010 05:30	-1.2	899.6	0.0	6.1	231.7
19-10-2010 05:40	-1.1	899.6	0.0	5.5	225.0
19-10-2010 05:50	-1.1	899.5	0.0	5.4	222.9
19-10-2010 06:00	-1.1	899.3	0.0	5.4	215.5
19-10-2010 06:10	-1.1	899.2	0.0	5.3	224.8
19-10-2010 06:20	-0.9	898.7	0.0	5.4	207.6
19-10-2010 06:30	-0.9	898.6	0.0	6.4	218.4
19-10-2010 06:40	-0.9	898.4	0.0	7.1	222.2
19-10-2010 06:50	-0.9	897.9	0.0	7.7	228.3
19-10-2010 07:00	-0.9	897.7	0.0	7.6	239.2
19-10-2010 07:10	-0.8	897.6	0.0	8.0	228.8
19-10-2010 07:20	-0.8	897.2	0.0	7.4	225.0
19-10-2010 07:30	-0.8	897.2	0.0	7.9	231.4
19-10-2010 07:40	-0.7	897.2	0.0	7.4	231.4
19-10-2010 07:50	-0.7	897.4	0.0	5.6	238.6
19-10-2010 08:00	-0.7	897.5	0.0	4.8	232.2
19-10-2010 08:10	-0.6	897.6	0.0	4.7	238.7
19-10-2010 08:20	-0.7	897.7	0.0	4.6	232.7
19-10-2010 08:30	-0.7	897.7	0.0	2.3	232.3
19-10-2010 08:40	-0.7	897.7	0.0	0.0	
19-10-2010 08:50	-0.6	897.6	0.0	0.0	
19-10-2010 09:00	-0.6	897.6	0.0	3.7	229.3

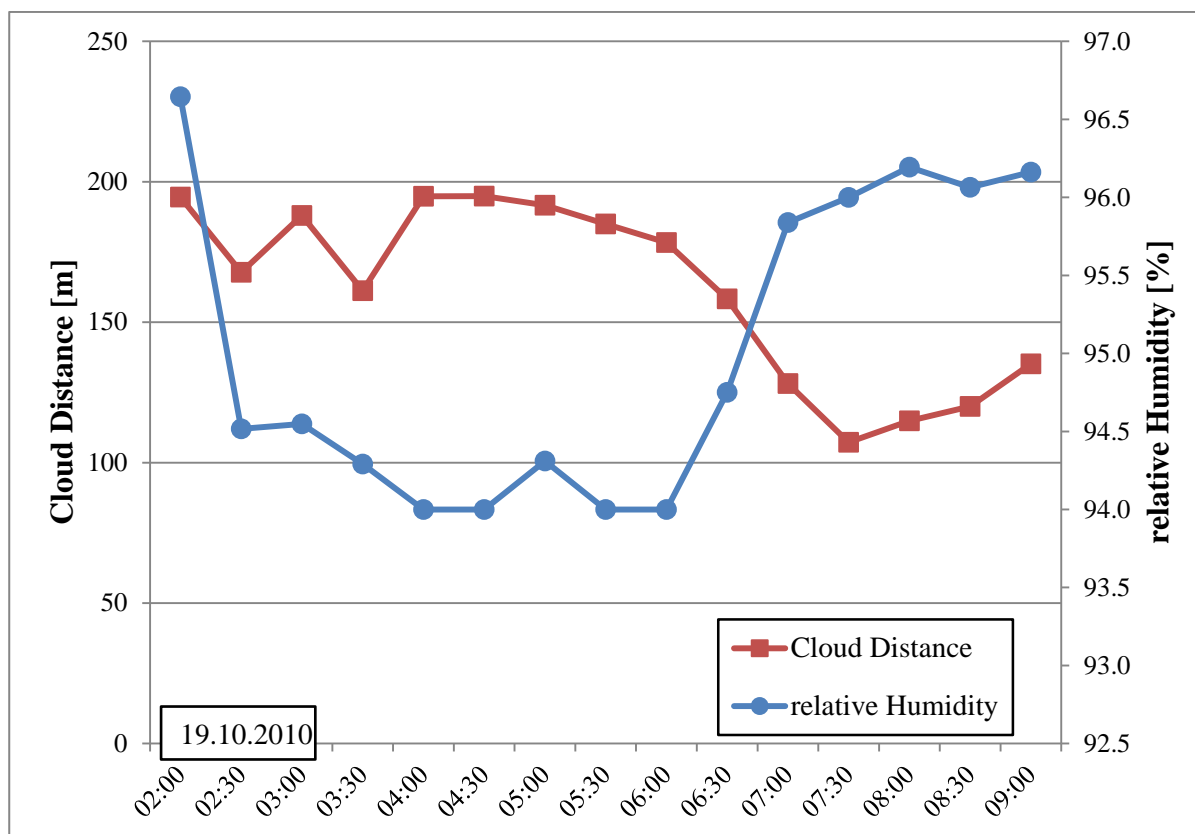


Fig. J 11 Cloud height and relative humidity on cloud event FCE22.0.

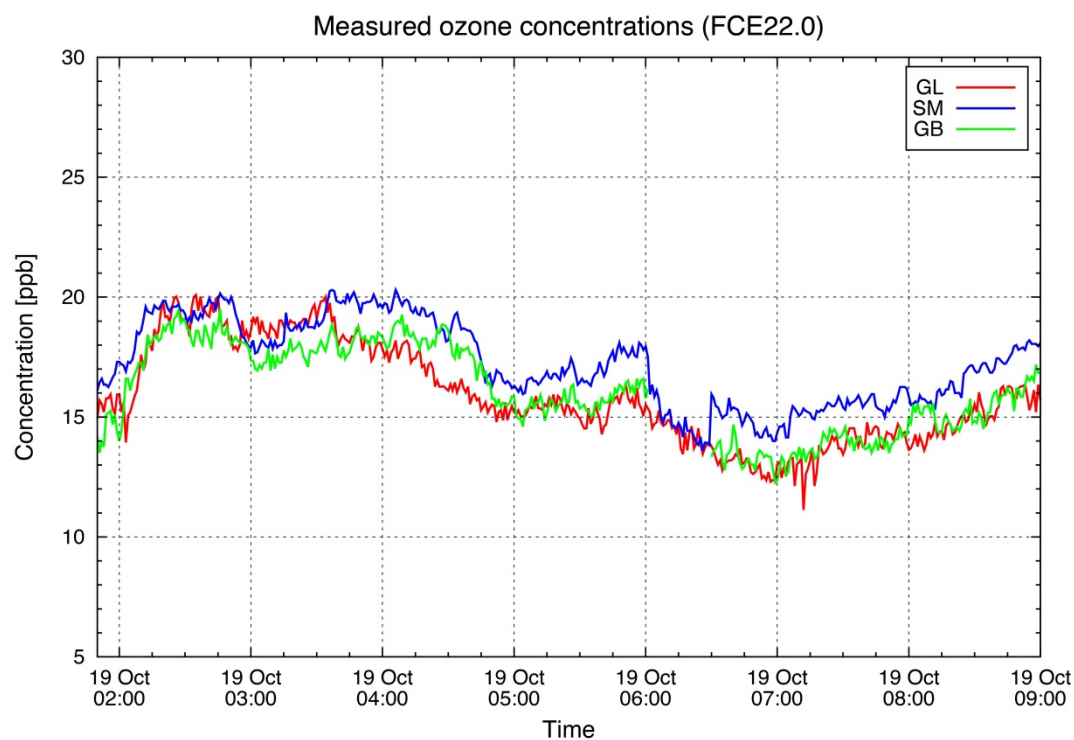


Fig. J 12 Measured ozone concentration over the full event.

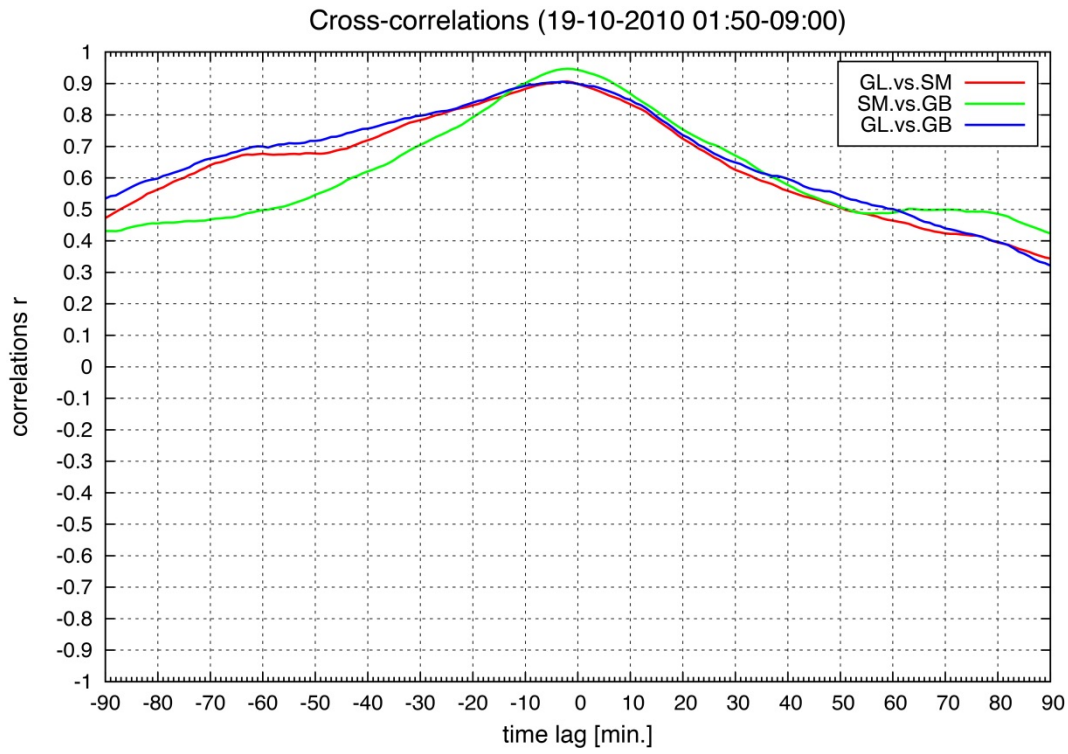


Fig. J 13 Cross-correlation of the full event.

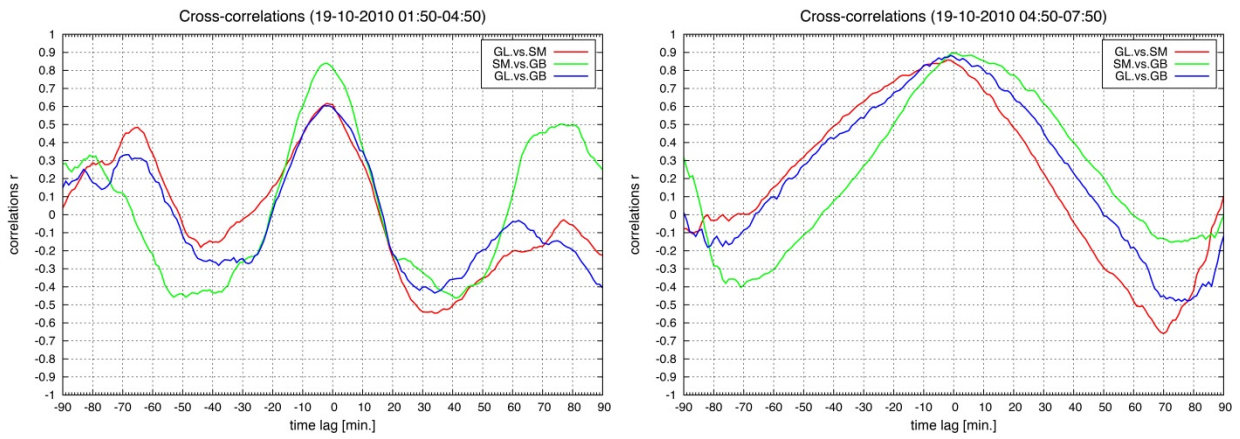


Fig. J 14 Cross-correlation on 19-10-2010, 01:50 – 04:50 CEST and 04:50 – 07:50 CEST.

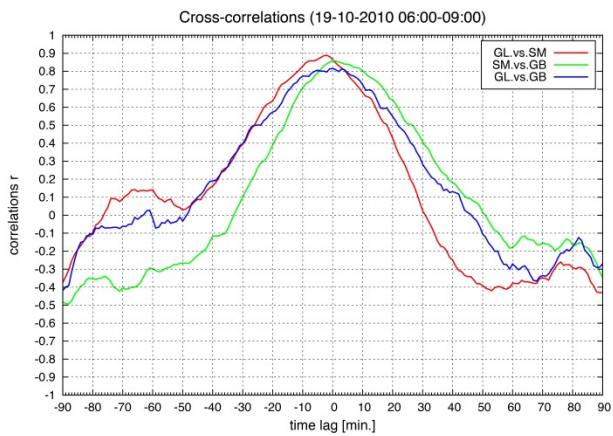


Fig. J 15 Cross-correlation on 06-10-2010, 06:00 – 09:00 CEST.

K: FCE22.1 (19-20).10.10 21:10 – 03:30 (CEST) (offline sampling 21:30 – 03:30 CEST)

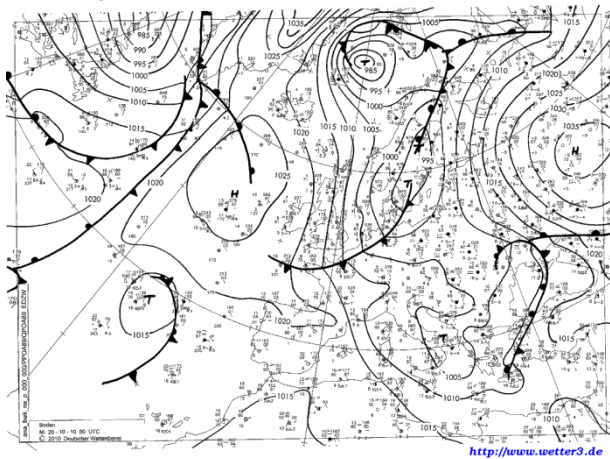


Fig. K 1 Surface weather charts on 20-10-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

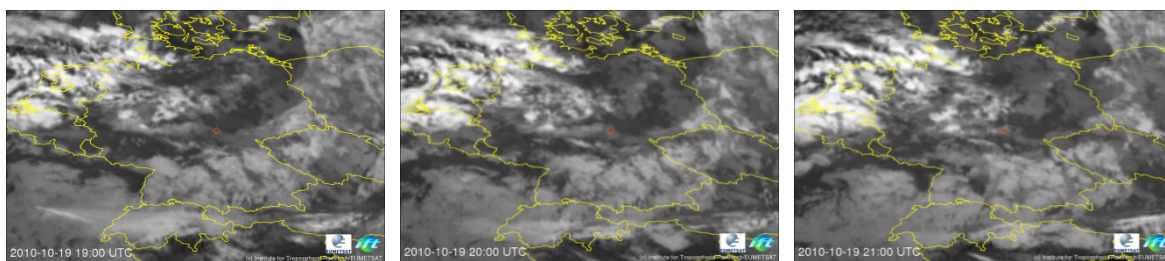


Fig. K 2 IR-satellite picture on 19-10-2010, 19, 20 and 21 UTC (source: ©TROPOS/EUMETSAT).

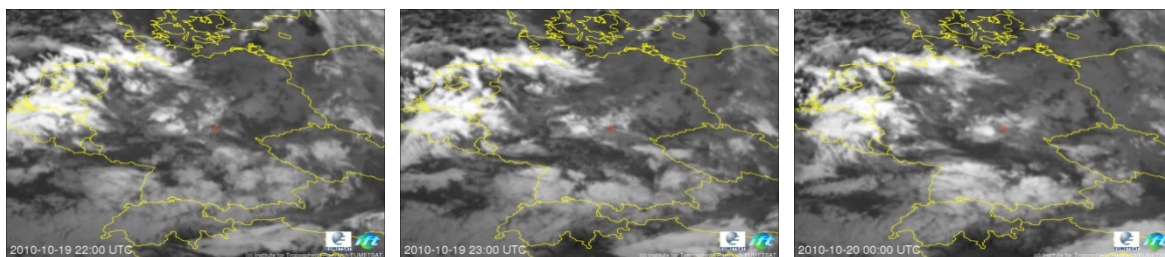


Fig. K 3 IR-satellite picture on 19-10-2010, 22 and 23 and 20 October, 00 UTC (source: ©TROPOS/EUMETSAT).

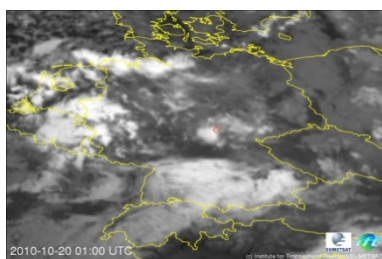


Fig. K 4 IR-satellite picture on 20-10-2010, 01 UTC (source: ©TROPOS/EUMETSAT).

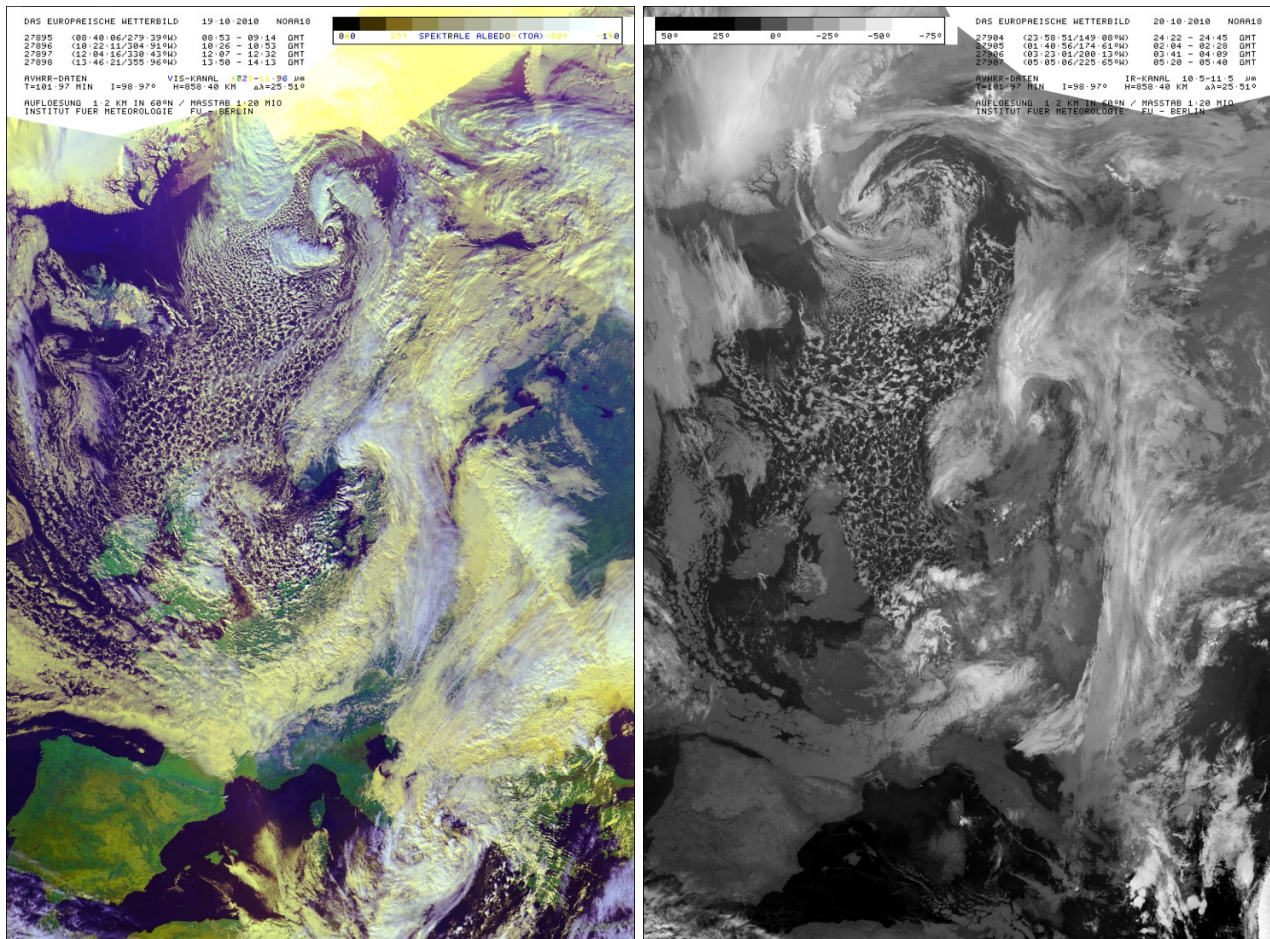


Fig. K 5 NOAA satellite pictures on 19-10-2010 and on 20-10-2010 (source: Berliner Wetterkarte e.V., 2010).

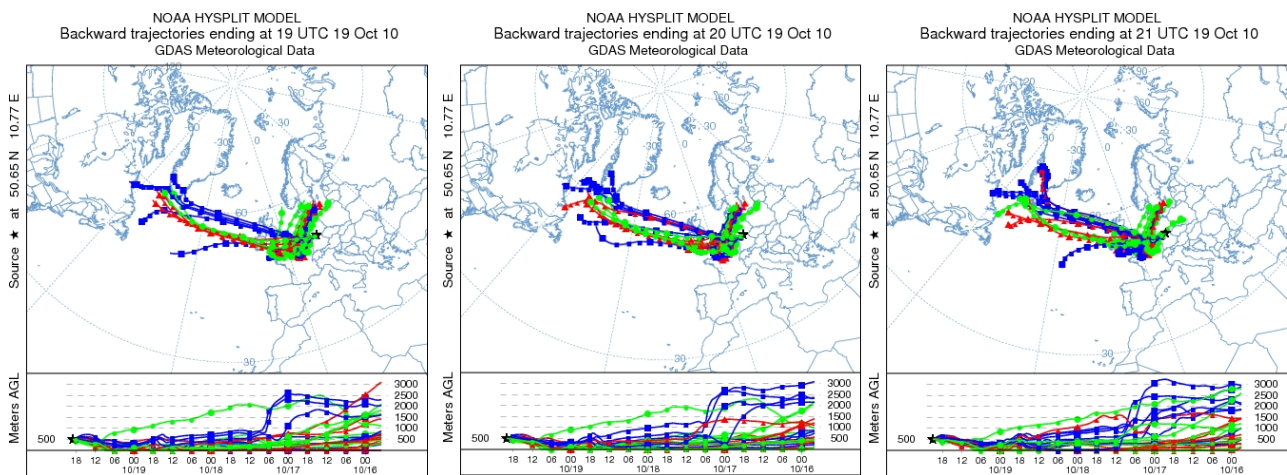


Fig. K 6 Backward trajectories on 19-10-2010, 19, 20 and 21 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

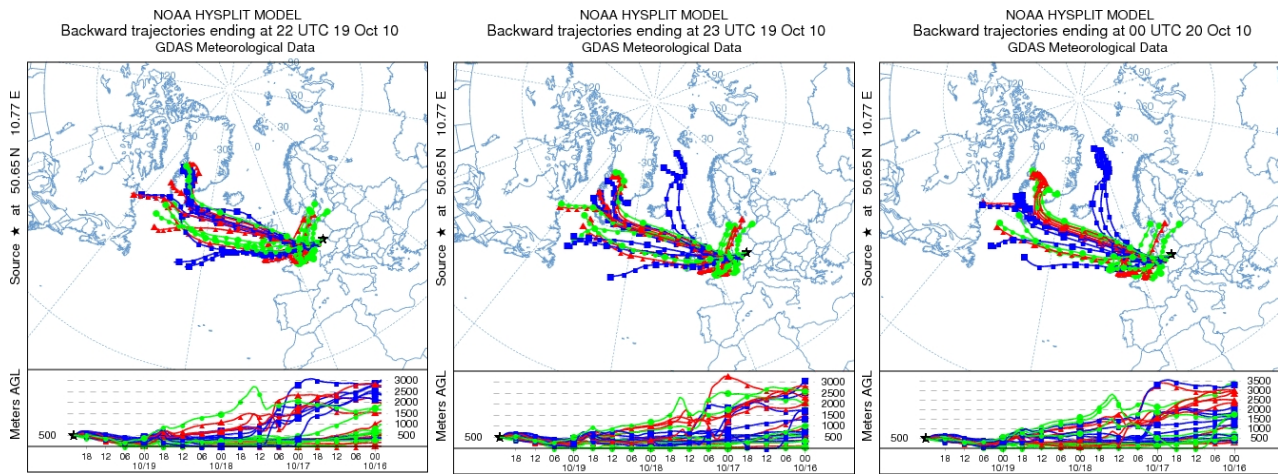


Fig. K 7 Backward trajectories on 19-10-2010, 22, 23 and 20-10-2010, 22 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

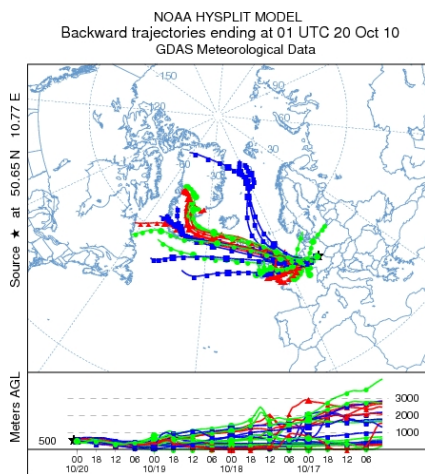


Fig. K 8 Backward trajectories on 20-10-2010, 01 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

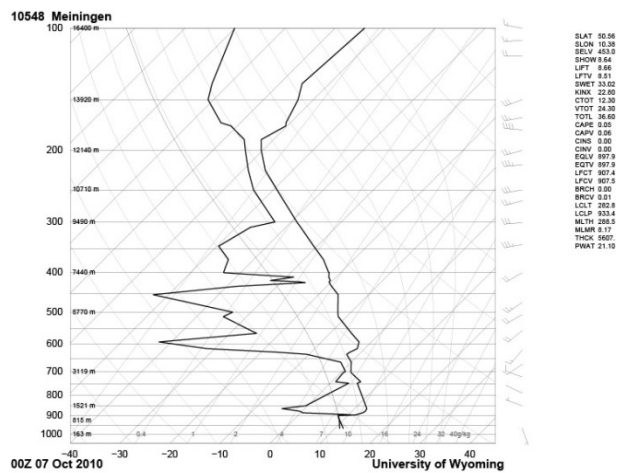


Fig. K 9 Vertical rawinsonde profiles of temperature and dew-point temperature on 20-10-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table K 1 Locally measured meteorological data at the summit station Schmücke on 19/20-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
19-10-2010 21:10	1.4	893.0	0.0	5.6	255.7
19-10-2010 21:20	1.4	892.9	0.0	4.3	262.2
19-10-2010 21:30	1.4	892.8	0.0	4.3	257.2
19-10-2010 21:40	1.4	892.7	0.0	4.6	257.2
19-10-2010 21:50	1.3	892.7	0.0	3.7	249.7
19-10-2010 22:00	1.3	892.7	0.2	4.0	241.8
19-10-2010 22:10	1.3	892.7	0.0	4.6	242.1
19-10-2010 22:20	1.2	892.5	0.0	4.7	250.0
19-10-2010 22:30	1.2	892.4	0.0	5.0	245.5
19-10-2010 22:40	1.1	892.4	0.0	5.0	232.7
19-10-2010 22:50	1.1	892.3	0.0	5.4	241.5
19-10-2010 23:00	1.2	892.3	0.0	5.0	247.1
19-10-2010 23:10	1.2	892.3	0.0	4.9	247.9
19-10-2010 23:20	1.2	892.0	0.0	4.9	247.5
19-10-2010 23:30	1.2	892.0	0.0	5.6	253.5
19-10-2010 23:40	1.2	892.0	0.0	5.1	260.3
19-10-2010 23:50	1.3	891.9	0.0	5.1	261.8
20.10.2010 00:00	1.3	891.9	0.0	4.7	255.2
20.10.2010 00:10	1.3	891.9	0.0	4.9	243.1
20.10.2010 00:20	1.3	891.8	0.0	4.3	243.9
20.10.2010 00:30	1.3	891.7	0.0	4.6	247.1
20.10.2010 00:40	1.3	891.7	0.0	4.7	246.5
20.10.2010 00:50	1.3	891.6	0.0	4.8	245.6
20.10.2010 01:00	1.3	891.5	0.0	4.2	233.0
20.10.2010 01:10	1.3	891.5	0.0	4.1	256.1
20.10.2010 01:20	1.4	891.5	0.0	3.3	251.8
20.10.2010 01:30	1.4	891.5	0.0	3.8	237.7
20.10.2010 01:40	1.4	891.5	0.0	3.5	244.4
20.10.2010 01:50	1.4	891.4	0.0	4.8	241.3
20.10.2010 02:00	1.4	891.3	0.0	5.3	243.3
20.10.2010 02:10	1.3	891.3	0.0	5.0	249.1
20.10.2010 02:20	1.3	891.3	0.0	5.1	243.5
20.10.2010 02:30	1.2	891.2	0.0	5.0	249.6
20.10.2010 02:40	1.1	891.2	0.2	5.1	246.5
20.10.2010 02:50	0.9	891.2	0.0	4.7	250.8
20.10.2010 03:00	0.8	891.1	0.0	4.9	254.8
20.10.2010 03:10	0.6	891.0	0.2	5.4	257.8
20.10.2010 03:20	0.4	891.1	0.0	4.9	262.6
20.10.2010 03:30	0.4	891.1	0.0	4.3	264.0

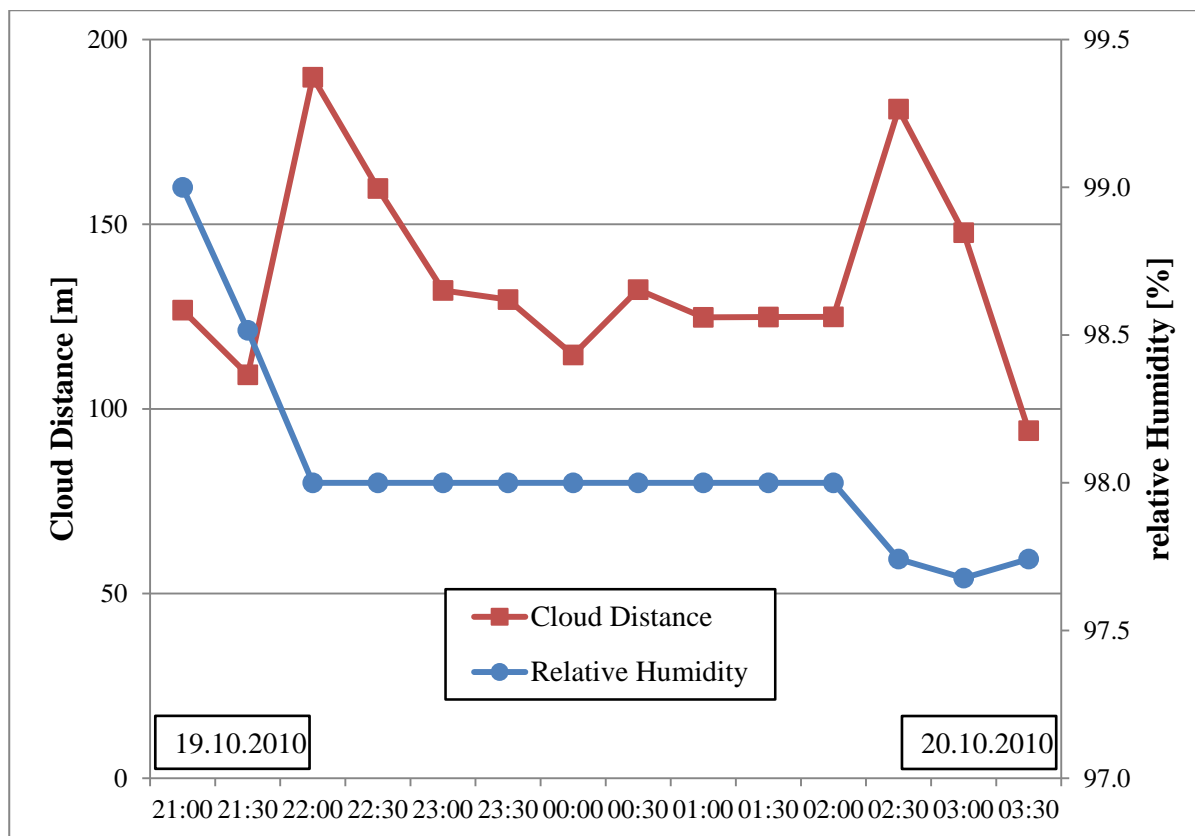


Fig. K 10 Cloud height and relative humidity on cloud event FCE22.1.

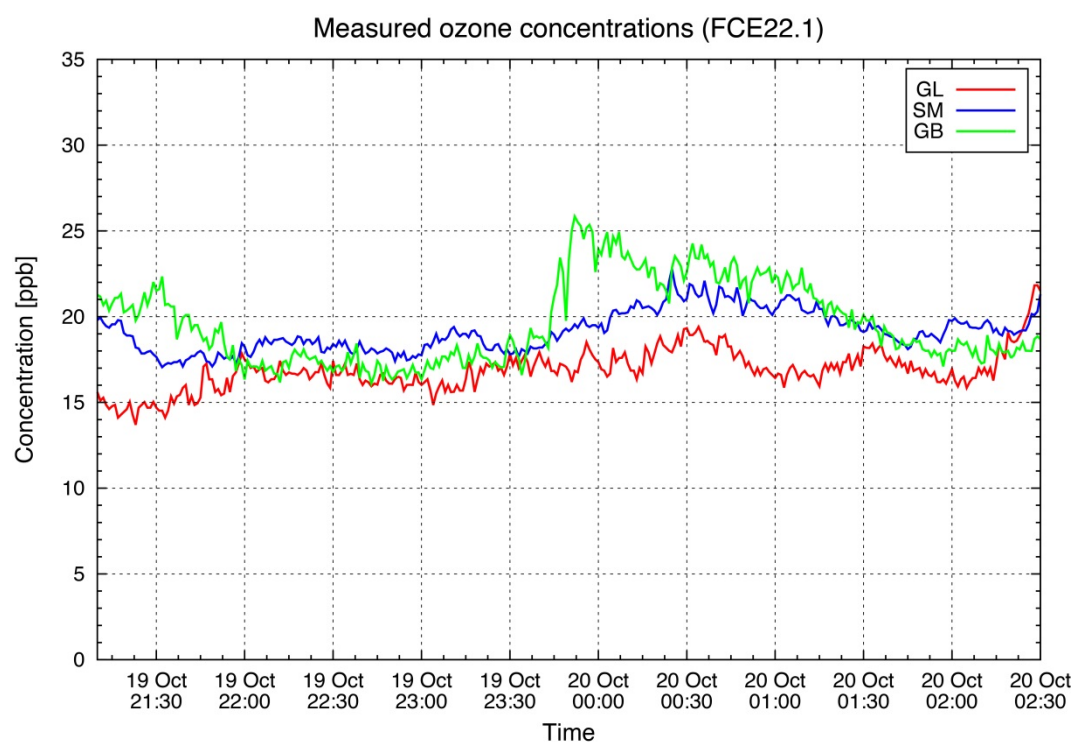


Fig. K 11 Measured ozone concentration over the full event.

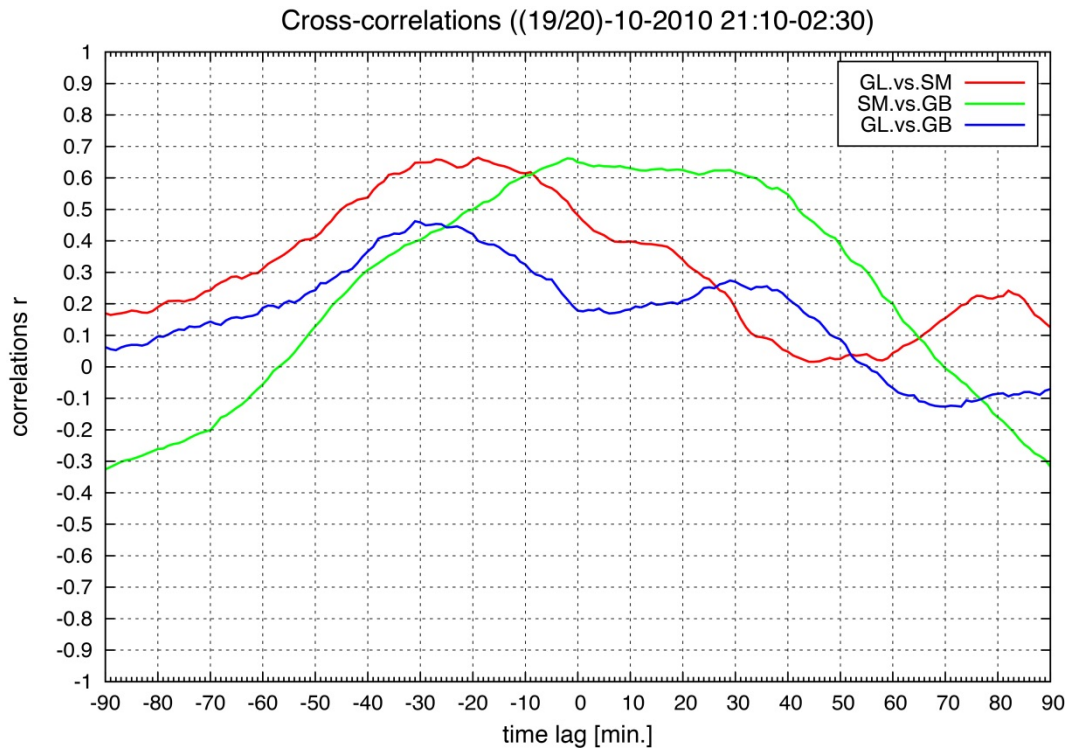


Fig. K 12 Cross-correlation of the full event.

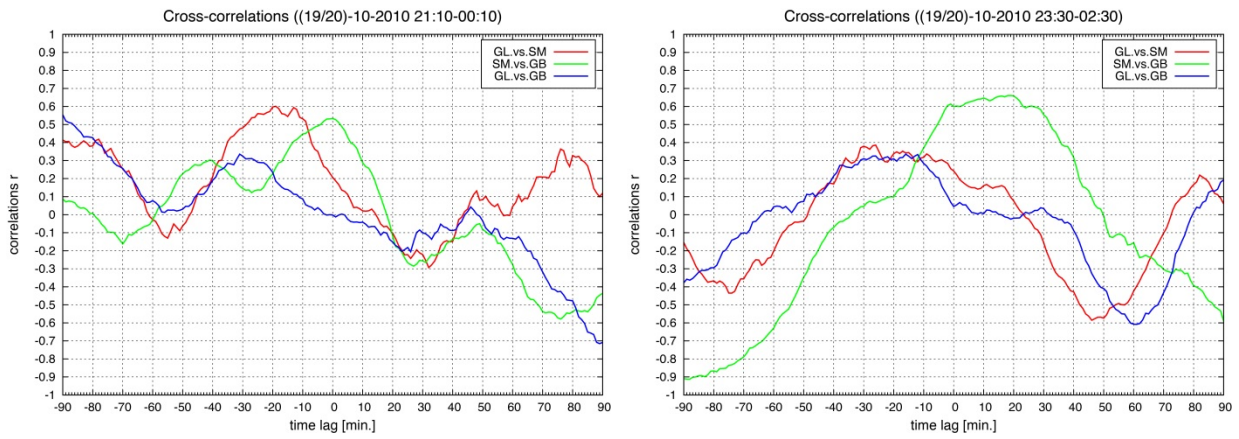


Fig. K 13 Cross-correlation on 19 and 20-10-2010, 21:10 – 00:10 CEST and 23:30 – 02:30 CEST.

L: FCE24.0 (21-22).10.10 22:10 – 10:00 (CEST)

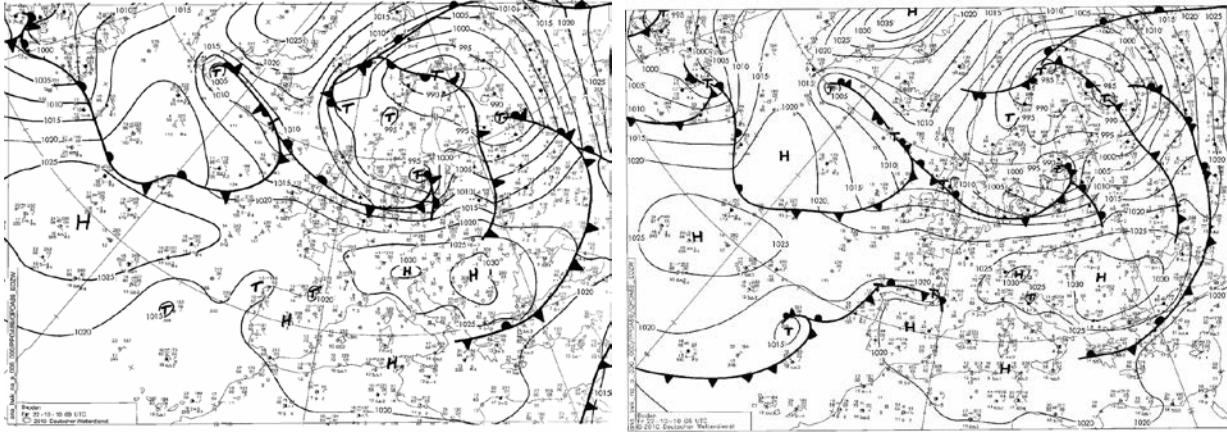


Fig. L 1 Surface weather charts on 21-10-2010, 00 and 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

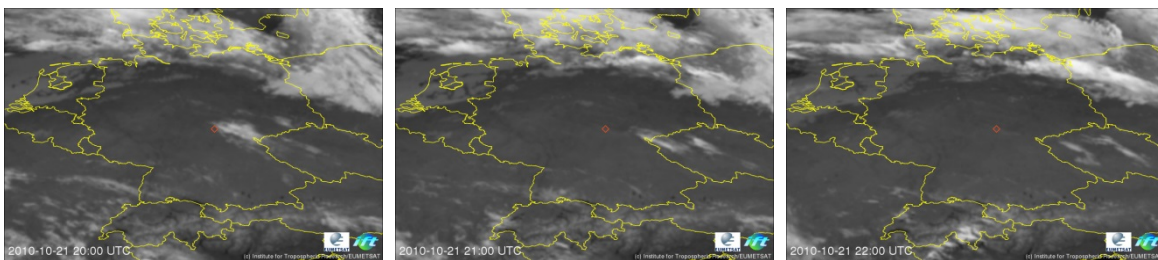


Fig. L 2 IR-satellite picture on 21-10-2010, 20, 21 and 22 UTC (source: ©TROPUS/EUMETSAT).

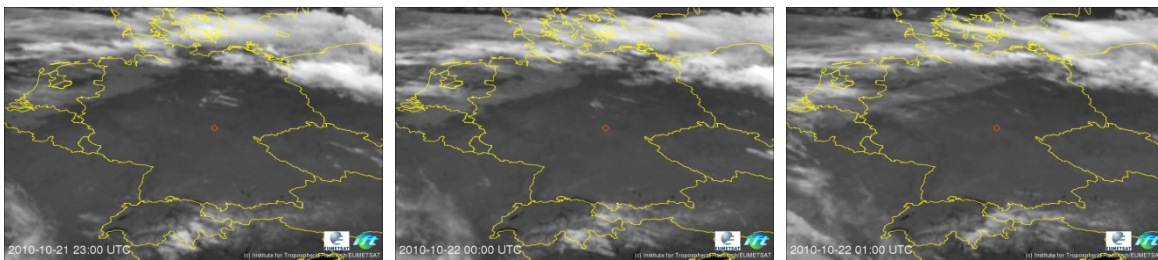


Fig. L 3 IR-satellite picture on 21-10-2010, 23 and 22-10-2010, 00 and 01 UTC (source: ©TROPUS/EUMETSAT).

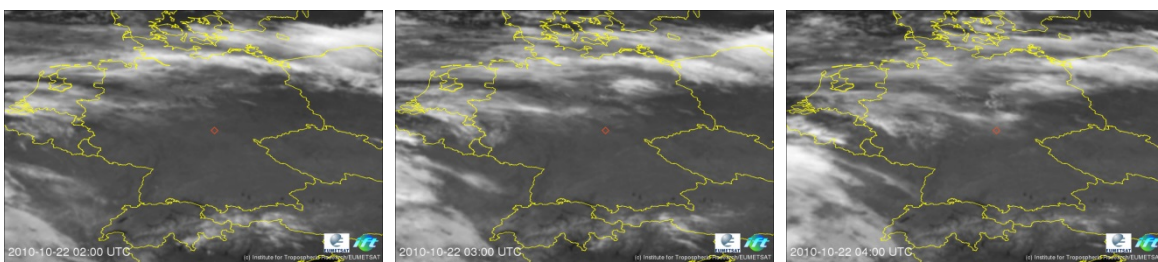


Fig. L 4 IR-satellite picture on 22-10-2010, 02, 03 and 04 UTC (source: ©TROPUS/EUMETSAT).

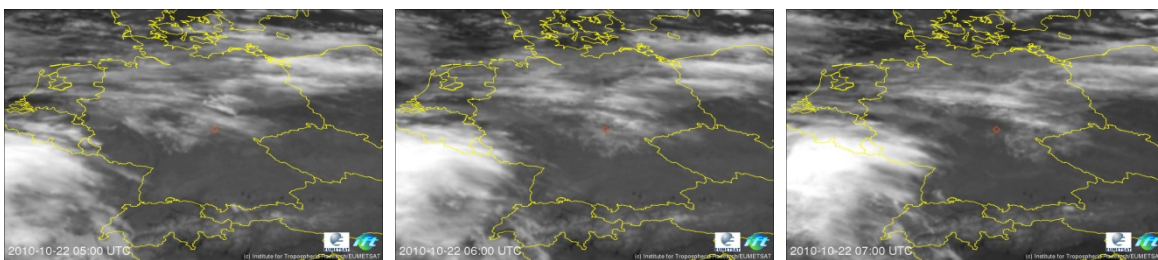


Fig. L 5 IR-satellite picture on 22-10-2010, 05, 06 and 07 UTC (source: ©TROPUS/EUMETSAT).

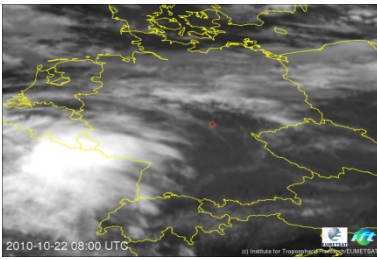


Fig. L 6 IR-satellite picture on 22-10-2010, 08 UTC (source: ©TROPOS/EUMETSAT).



Fig. L 7 VIS-satellite picture on 22-10-2010, 07 and 08 UTC (source: ©TROPOS/EUMETSAT).

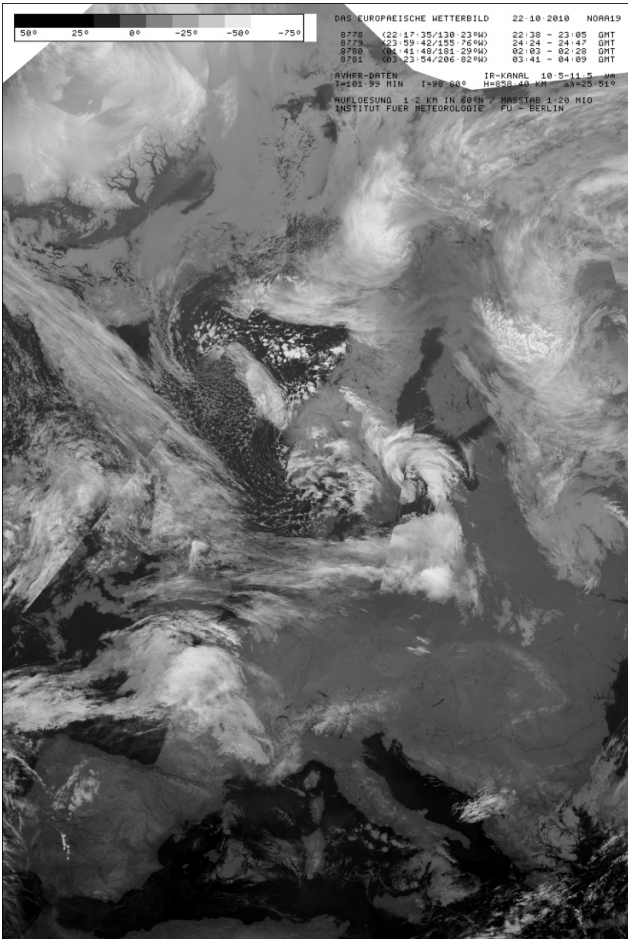


Fig. L 8 NOAA satellite pictures on 22-10-2010 (source: Berliner Wetterkarte e.V., 2010).

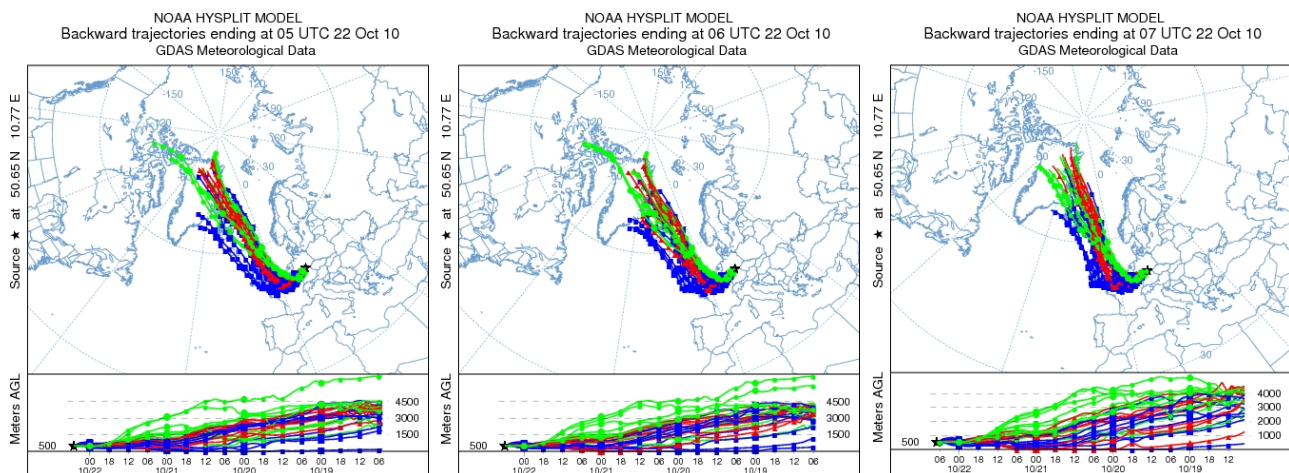


Fig. L 12 Backward trajectories on 22-10-2010, 05, 06 and 07 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

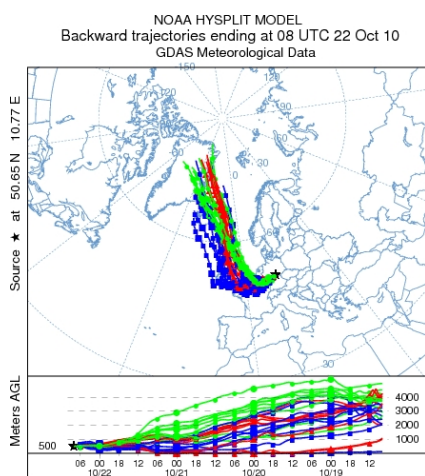


Fig. L 13 Backward trajectories on 22-10-2010, 08 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

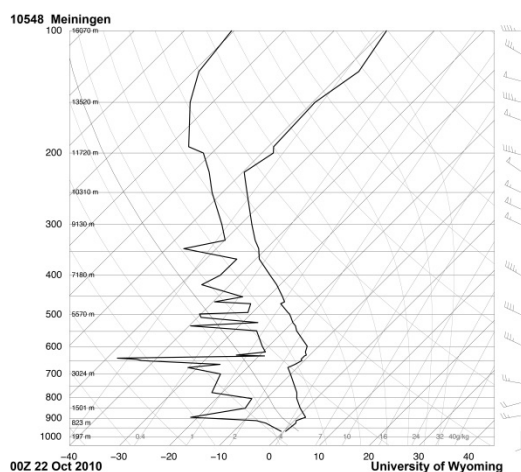


Fig. L 14 Vertical rawinsonde profiles of temperature and dew-point temperature on 22-10-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table L 1 Locally measured meteorological data at the summit station Schmücke on 21/22-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
21-10-2010 22:10	-1.4	909.5	0.0	5.3	229.0
21-10-2010 22:20	-1.4	909.4	0.0	5.5	232.5
21-10-2010 22:30	-1.4	909.3	0.0	5.7	231.6
21-10-2010 22:40	-1.5	909.3	0.0	5.7	238.9
21-10-2010 22:50	-1.5	909.0	0.0	5.6	241.5
21-10-2010 23:00	-1.6	909.0	0.0	5.6	243.7
21-10-2010 23:10	-1.6	909.0	0.0	5.3	243.1
21-10-2010 23:20	-1.7	908.9	0.0	5.6	233.7
21-10-2010 23:30	-1.7	908.7	0.0	6.1	237.0
21-10-2010 23:40	-1.8	908.6	0.0	5.9	238.5
21-10-2010 23:50	-1.8	908.5	0.0	6.5	246.5
22-10-2010 00:00	-1.8	908.4	0.0	6.4	238.7
22-10-2010 00:10	-1.9	908.4	0.0	5.5	239.2
22-10-2010 00:20	-2.0	908.4	0.0	6.2	235.5
22-10-2010 00:30	-2.0	908.3	0.0	5.7	237.6
22-10-2010 00:40	-2.1	908.2	0.0	5.7	238.5
22-10-2010 00:50	-2.2	908.2	0.0	5.5	245.2
22-10-2010 01:00	-2.3	908.3	0.0	4.9	239.2
22-10-2010 01:10	-2.3	908.3	0.0	4.3	232.8
22-10-2010 01:20	-2.3	908.4	0.0	4.4	238.2
22-10-2010 01:30	-2.3	908.3	0.0	3.7	245.0
22-10-2010 01:40	-2.3	908.3	0.0	3.8	241.0
22-10-2010 01:50	-2.4	908.3	0.0	4.1	247.0
22-10-2010 02:00	-2.4	908.2	0.0	3.6	239.0
22-10-2010 02:10	-2.4	908.1	0.0	3.9	243.0
22-10-2010 02:20	-2.5	908.0	0.0	4.0	236.9
22-10-2010 02:30	-2.6	907.9	0.0	5.0	239.0
22-10-2010 02:40	-2.6	907.9	0.0	4.6	247.0
22-10-2010 02:50	-2.7	907.7	0.0	4.5	241.0
22-10-2010 03:00	-2.7	907.6	0.0	4.4	243.0
22-10-2010 03:10	-2.8	907.5	0.0	4.5	243.0
22-10-2010 03:20	-2.8	907.4	0.0	5.1	233.0
22-10-2010 03:30	-2.9	907.2	0.0	5.6	243.0
22-10-2010 03:40	-3.0	907.1	0.0	5.8	243.0
22-10-2010 03:50	-3.0	907.0	0.0	5.4	237.0
22-10-2010 04:00	-3.1	906.9	0.0	5.9	235.0
22-10-2010 04:10	-3.2	906.9	0.0	5.9	231.0
22-10-2010 04:20	-3.3	906.7	0.0	6.0	239.0
22-10-2010 04:30	-3.3	906.6	0.0	5.2	239.0
22-10-2010 04:40	-3.3	906.5	0.0	5.1	237.0
22-10-2010 04:50	-3.3	906.6	0.0	4.7	241.0
22-10-2010 05:00	-3.3	906.5	0.0	4.2	245.0
22-10-2010 05:10	-3.3	906.5	0.0	4.6	243.0

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
22-10-2010 05:20	-3.4	906.4	0.0	4.6	237.0
22-10-2010 05:30	-3.4	906.4	0.0	4.2	241.0
22-10-2010 05:40	-3.5	906.4	0.0	4.9	247.0
22-10-2010 05:50	-3.5	906.4	0.0	5.0	245.0
22-10-2010 06:00	-3.5	906.3	0.0	5.4	247.0
22-10-2010 06:10	-3.6	906.3	0.0	5.7	247.0
22-10-2010 06:20	-3.6	906.0	0.0	6.0	247.0
22-10-2010 06:30	-3.7	906.1	0.0	5.6	243.0
22-10-2010 06:40	-3.7	906.2	0.0	4.9	245.0
22-10-2010 06:50	-3.7	906.3	0.0	4.4	241.0
22-10-2010 07:00	-3.8	906.3	0.0	4.8	245.0
22-10-2010 07:10	-3.9	906.3	0.0	4.6	247.0
22-10-2010 07:20	-3.9	906.3	0.0	5.1	247.0
22-10-2010 07:30	-4.0	906.2	0.0	5.2	241.0
22-10-2010 07:40	-4.0	906.2	0.0	4.4	245.0
22-10-2010 07:50	-4.1	906.3	0.0	4.2	241.0
22-10-2010 08:00	-4.2	906.4	0.0	4.9	243.0
22-10-2010 08:10	-4.2	906.4	0.0	4.8	245.0
22-10-2010 08:20	-4.2	906.4	0.0	4.6	243.0
22-10-2010 08:30	-4.2	906.4	0.0	4.6	239.0
22-10-2010 08:40	-4.2	906.4	0.0	4.4	243.0
22-10-2010 08:50	-4.2	906.8	0.0	4.1	239.0
22-10-2010 09:00	-4.1	906.9	0.0	3.6	239.0
22-10-2010 09:10	-4.1	906.9	0.0	3.7	245.0
22-10-2010 09:20	-4.1	907.0	0.0	3.5	245.0
22-10-2010 09:30	-3.9	906.9	0.0	3.3	245.0
22-10-2010 09:40	-3.8	906.9	0.0	3.4	246.8
22-10-2010 09:50	-3.7	907.0	0.0	3.2	241.7
22-10-2010 10:00	-3.6	907.0	0.0	3.3	241.7

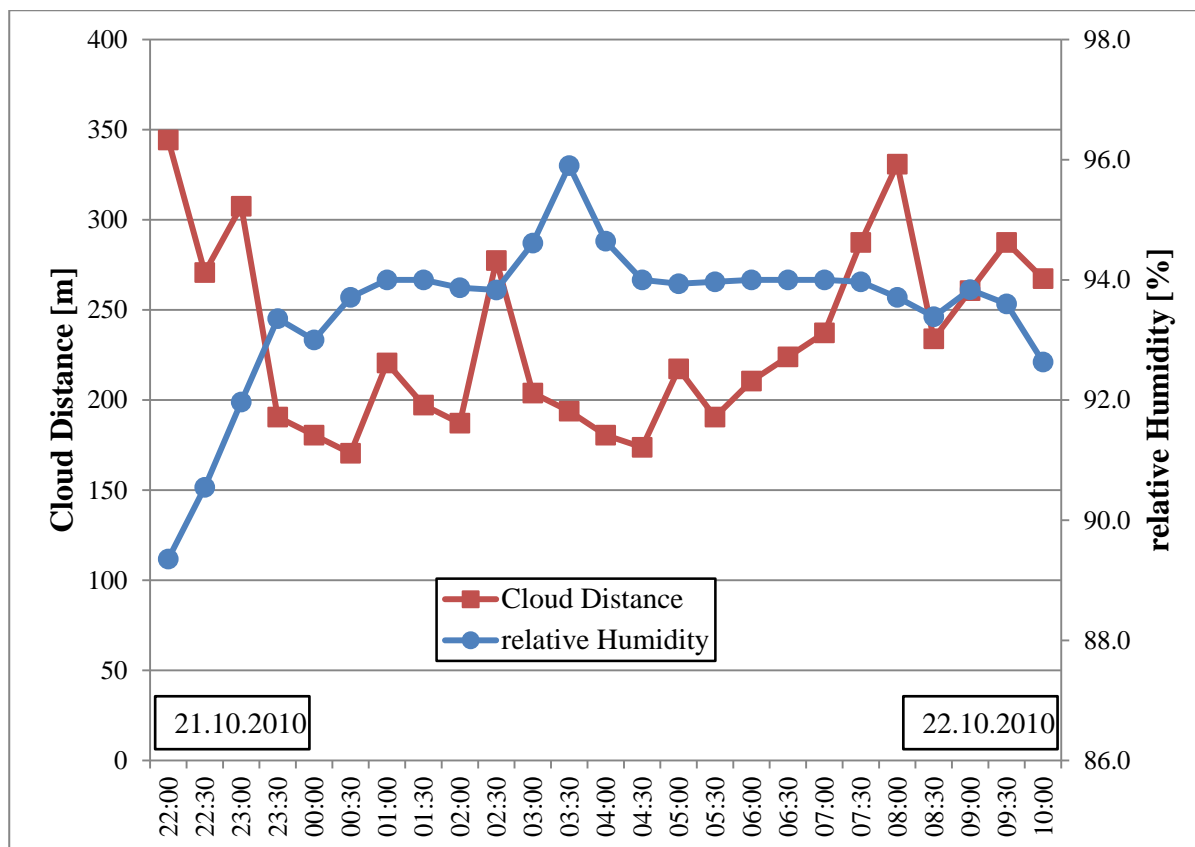


Fig. L 15 Cloud height and relative humidity on cloud event FCE24.0.

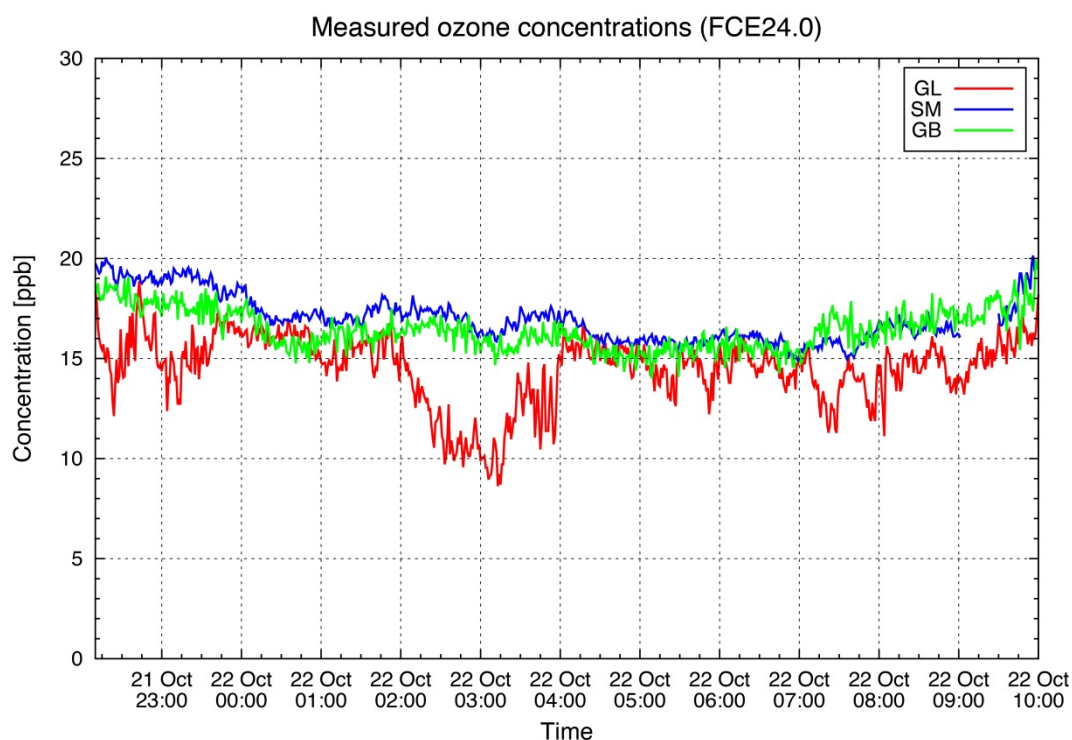


Fig. L 16 Measured ozone concentration over the full event.

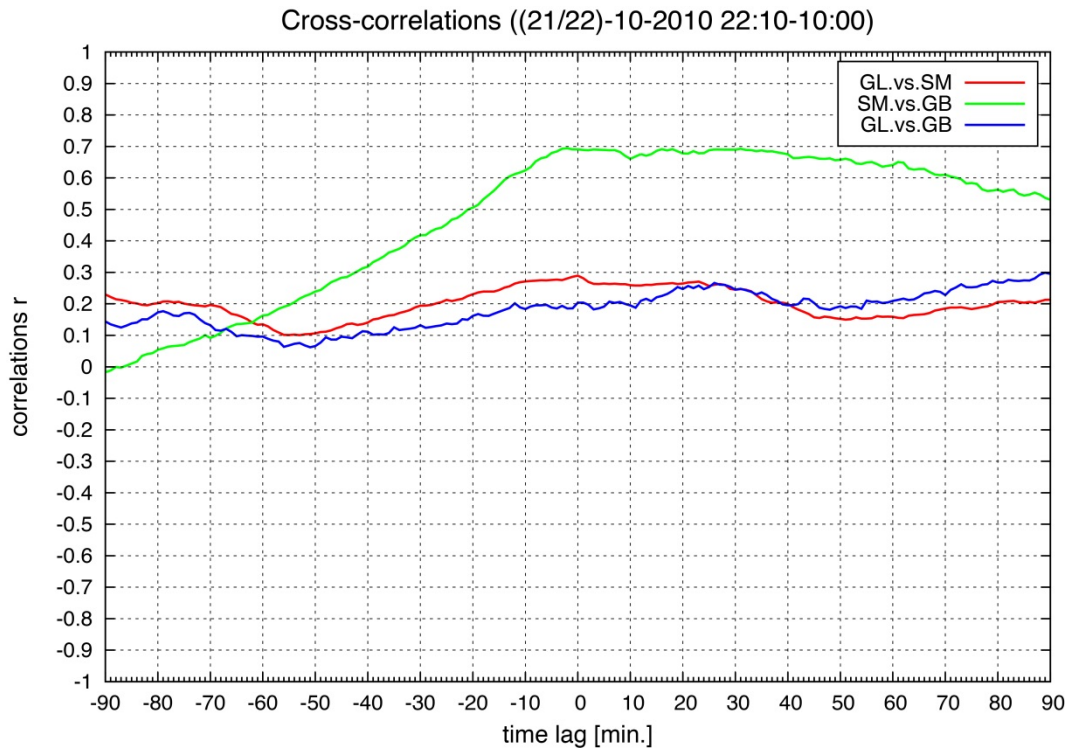


Fig. L 17 Cross-correlation of the full event.

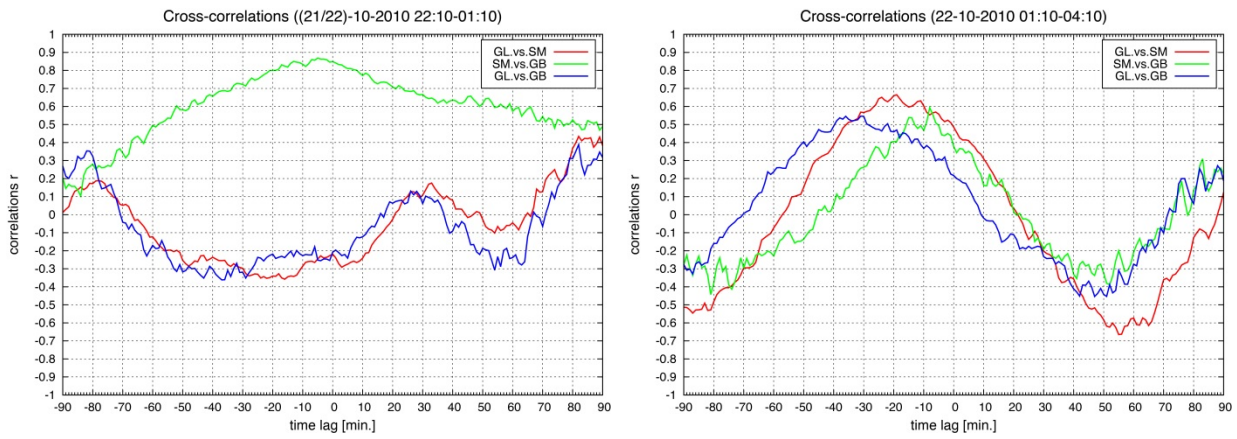


Fig. L 18 Cross-correlation on 21 and 22-10-2010, 22:10 – 01:10 CEST and 01:10 – 04:10 CEST.

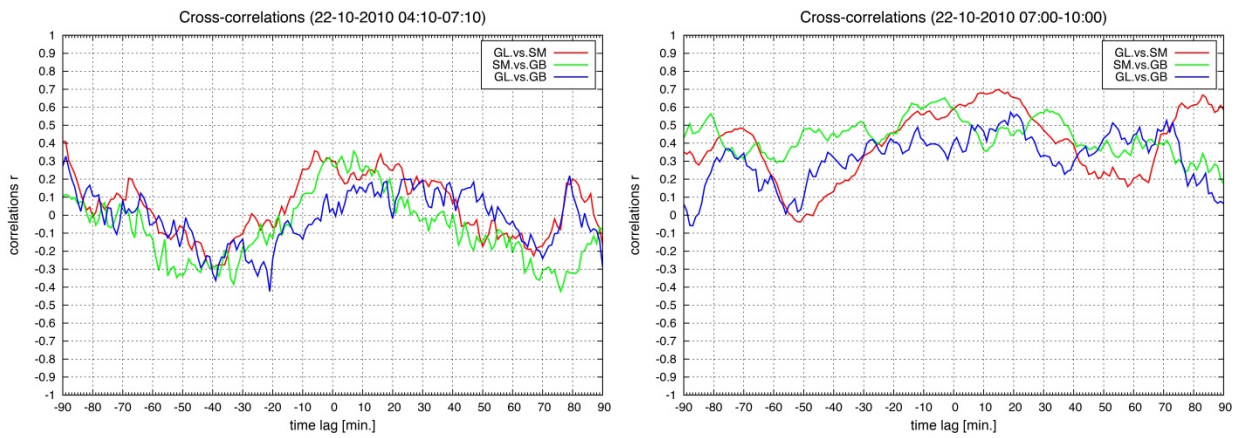


Fig. L 19 Cross-correlation on 22-10-2010, 04:10 – 07:10 CEST and 07:00 – 10:00 CEST.

M: FCE26.1 (23-24).10.10 23:40 – 08:45 (CEST) (offline sampling 01:30 – 08:45 CEST)

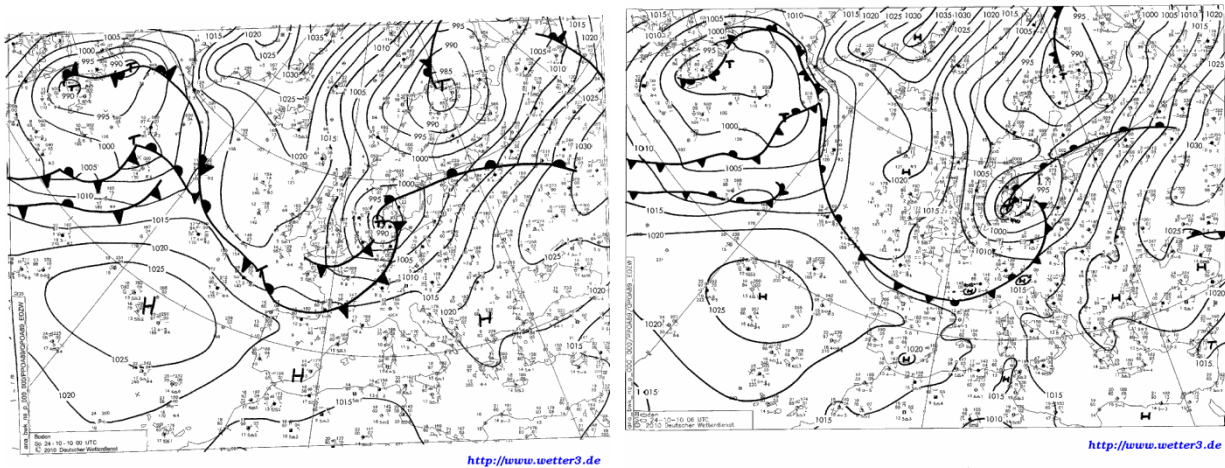


Fig. M 1 Surface weather charts on 24-10-2010, 00 and 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).



Fig. M 2 IR-satellite picture on 23-10-2010 22 and 23 and 24-10-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

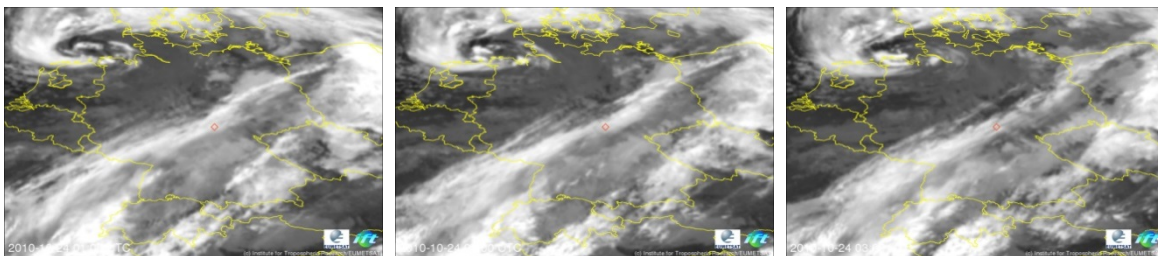


Fig. M 3 IR-satellite picture on 24-10-2010, 01, 02 and 03 UTC (source: ©TROPOS/EUMETSAT).

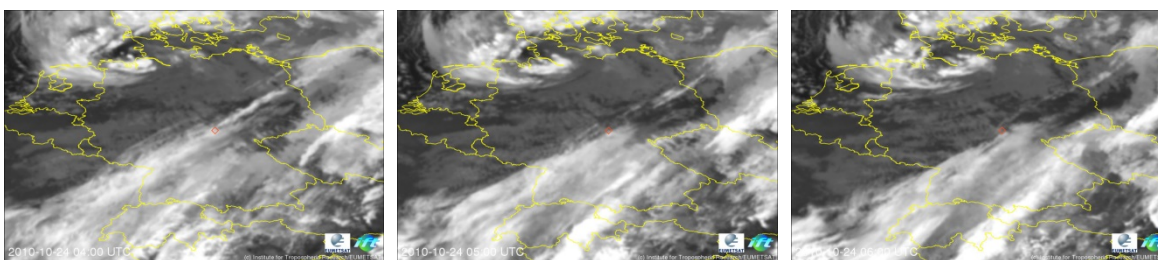


Fig. M 4 IR-satellite picture on 24-10-2010, 04, 05 and 06 UTC (source: ©TROPOS/EUMETSAT).

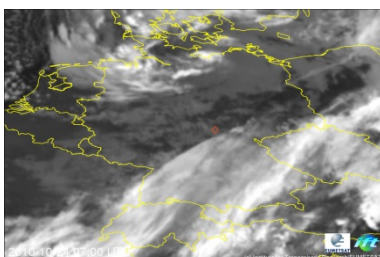


Fig. M 5 IR-satellite picture on 24-10-2010, 07 UTC (source: ©TROPOS/EUMETSAT).

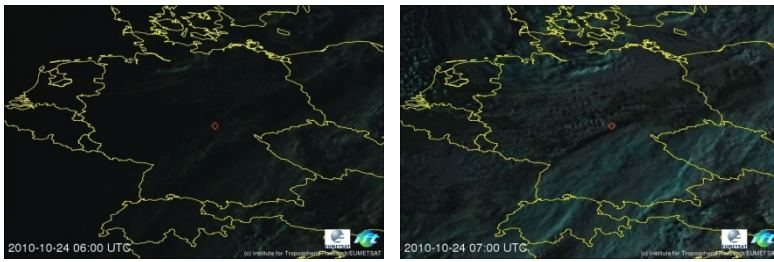


Fig. M 6 VIS-satellite picture on 24-10-2010, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

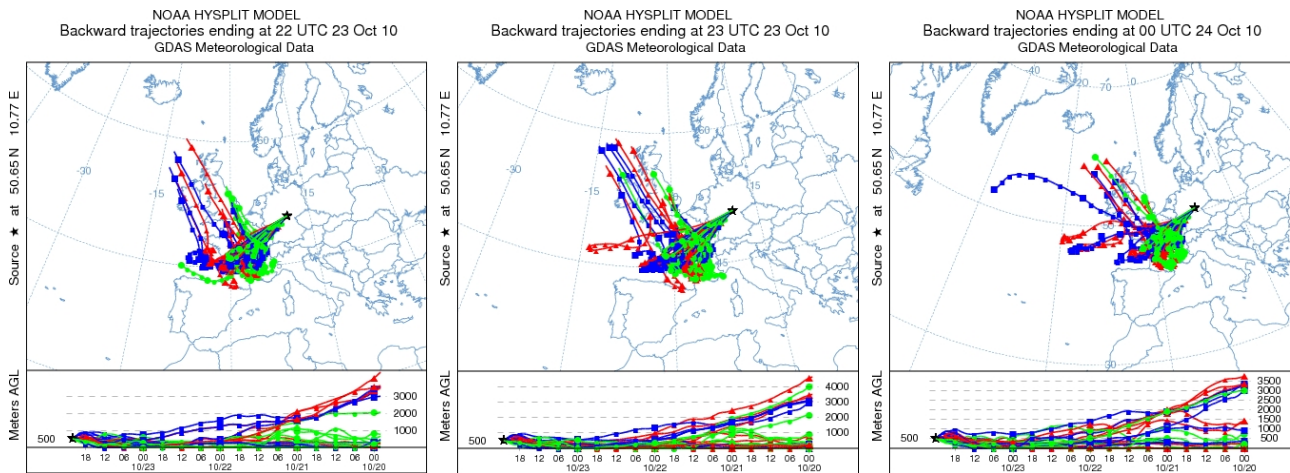


Fig. M 7 Backward trajectories on 23-10-2010 2010, 22 and 23 and on 24-10-2010, 00 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

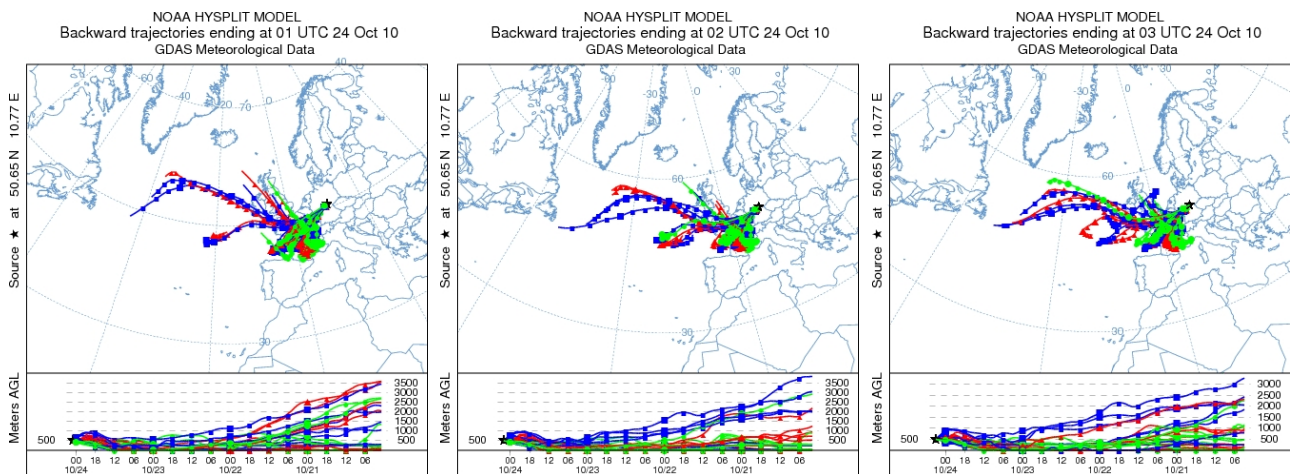


Fig. M 8 Backward trajectories on 24-10-2010, 01, 02 and 03 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

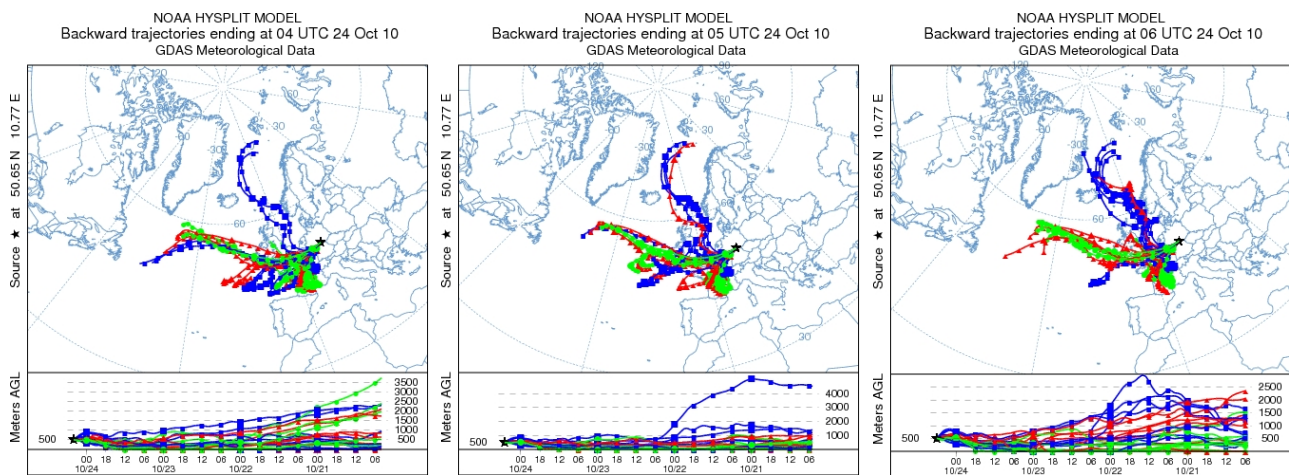


Fig. M 9 Backward trajectories on 24-10-2010, 04, 05 and 06 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

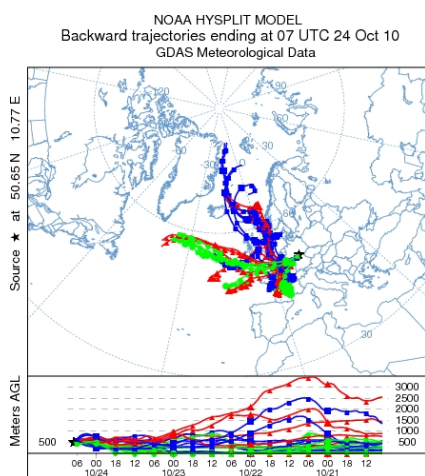


Fig. M 10 Backward trajectories on 24-10-2010, 07 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

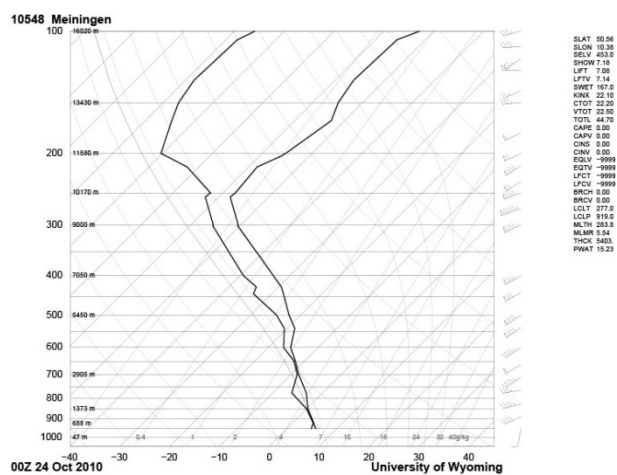


Fig. M 11 Vertical rawinsonde profiles of temperature and dew-point temperature on 24-10-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table M 1 Locally measured meteorological data at the summit station Schmücke on 23/24-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
23-10-2010 23:40	3.1	893.0	0.0	12.7	226.9
23-10-2010 23:50	3.1	892.9	0.0	13.2	231.3
24-10-2010 00:00	3.1	892.8	0.0	13.0	227.0
24-10-2010 00:10	3.1	892.8	0.0	12.5	225.0
24-10-2010 00:20	3.1	892.5	0.0	12.8	224.9
24-10-2010 00:30	3.2	892.5	0.0	12.6	224.1
24-10-2010 00:40	3.2	892.5	0.0	12.6	221.1
24-10-2010 00:50	3.1	892.7	0.2	12.1	224.5
24-10-2010 01:00	3.1	892.5	0.0	11.7	228.9
24-10-2010 01:10	3.1	892.4	0.0	11.3	227.5
24-10-2010 01:20	3.1	892.7	0.0	11.5	225.2
24-10-2010 01:30	3.1	892.6	0.0	11.8	226.9
24-10-2010 01:40	2.9	892.5	0.0	10.5	225.0
24-10-2010 01:50	2.8	892.5	0.2	10.9	230.6
24-10-2010 02:00	2.8	892.5	0.2	9.2	224.5
24-10-2010 02:10	2.7	892.5	0.0	9.6	226.5
24-10-2010 02:20	2.9	892.4	0.0	11.3	228.5
24-10-2010 02:30	2.9	892.3	0.0	11.1	227.0
24-10-2010 02:40	2.9	892.2	0.0	11.0	223.5
24-10-2010 02:50	2.9	892.0	0.0	11.2	223.1
24-10-2010 03:00	2.8	892.2	0.0	10.7	226.6
24-10-2010 03:10	2.7	892.4	0.0	10.7	228.3
24-10-2010 03:20	2.7	892.3	0.0	9.5	231.0
24-10-2010 03:30	2.7	892.4	0.0	9.2	225.0
24-10-2010 03:40	2.7	892.4	0.0	9.7	231.2
24-10-2010 03:50	2.6	892.5	0.0	8.9	233.2
24-10-2010 04:00	2.6	892.5	0.0	9.0	234.4
24-10-2010 04:10	2.5	892.5	0.0	8.3	239.5
24-10-2010 04:20	2.5	892.8	0.0	8.2	234.8
24-10-2010 04:30	2.4	892.7	0.0	8.8	243.2
24-10-2010 04:40	2.3	892.7	0.0	8.3	233.0
24-10-2010 04:50	2.3	892.9	0.0	8.4	238.8
24-10-2010 05:00	2.3	892.8	0.0	8.7	227.3
24-10-2010 05:10	2.2	892.7	0.0	8.3	226.1
24-10-2010 05:20	2.2	892.9	0.0	8.4	238.1
24-10-2010 05:30	2.2	893.0	0.2	8.3	251.7
24-10-2010 05:40	2.2	893.0	0.0	6.6	250.8
24-10-2010 05:50	2.2	893.1	0.0	6.9	239.6
24-10-2010 06:00	2.2	893.2	0.0	7.8	241.4
24-10-2010 06:10	2.2	893.2	0.0	7.6	240.5
24-10-2010 06:20	2.1	893.3	0.0	7.6	233.7
24-10-2010 06:30	2.1	893.2	0.0	7.2	236.3
24-10-2010 06:40	2.0	893.2	0.0	8.0	230.0

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
24-10-2010 06:50	2.0	893.4	0.0	7.7	243.2
24-10-2010 07:00	1.9	893.3	0.0	7.1	242.5
24-10-2010 07:10	1.9	893.3	0.0	7.4	236.5
24-10-2010 07:20	1.9	893.4	0.0	8.1	233.5
24-10-2010 07:30	1.8	893.3	0.0	8.3	231.3
24-10-2010 07:40	1.8	893.2	0.0	8.1	231.5
24-10-2010 07:50	1.8	893.3	0.0	10.3	236.0
24-10-2010 08:00	1.8	893.4	0.0	10.0	227.6
24-10-2010 08:10	1.8	893.4	0.2	9.5	229.5
24-10-2010 08:20	1.8	893.6	0.0	9.5	226.9
24-10-2010 08:30	1.8	893.8	0.0	7.8	236.6
24-10-2010 08:40	1.7	894.0	0.0	9.1	232.2
24-10-2010 08:45	1.7	894.0	0.0	8.8	224.6

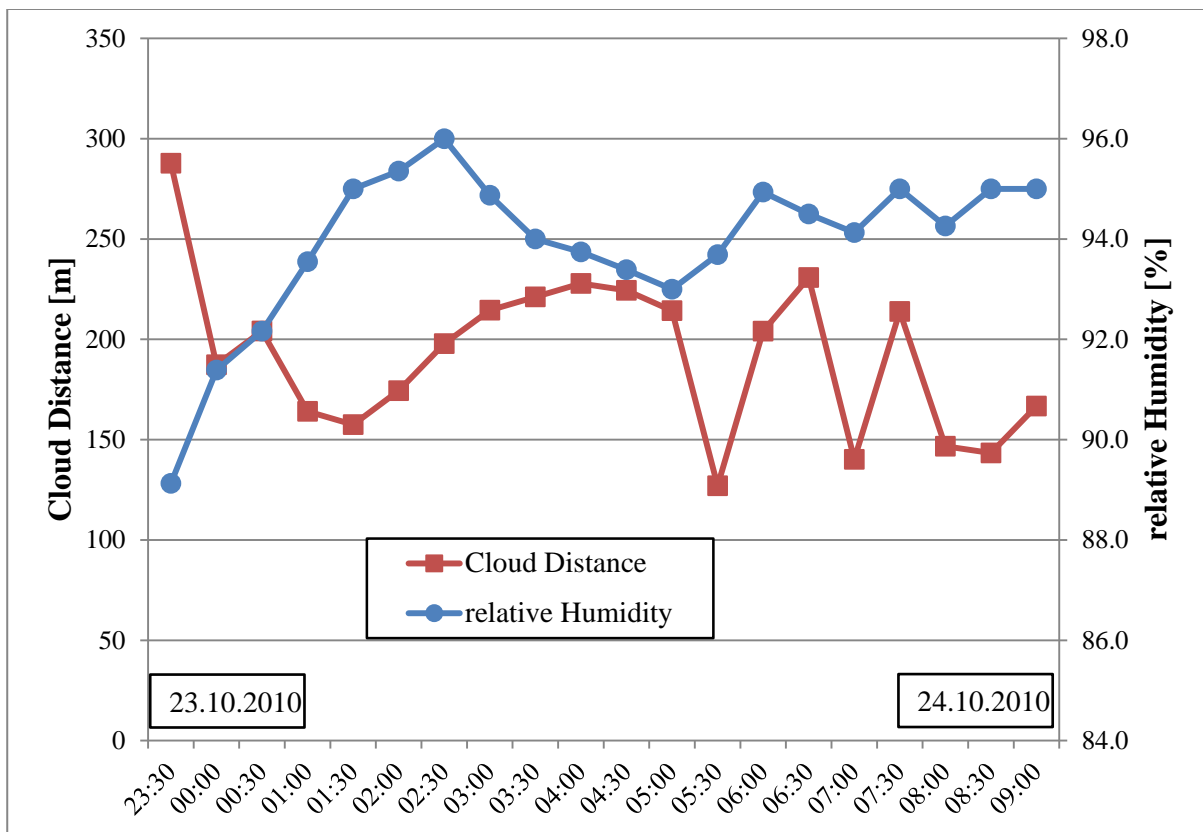


Fig. M 12 Cloud height and relative humidity on cloud event FCE26.1.

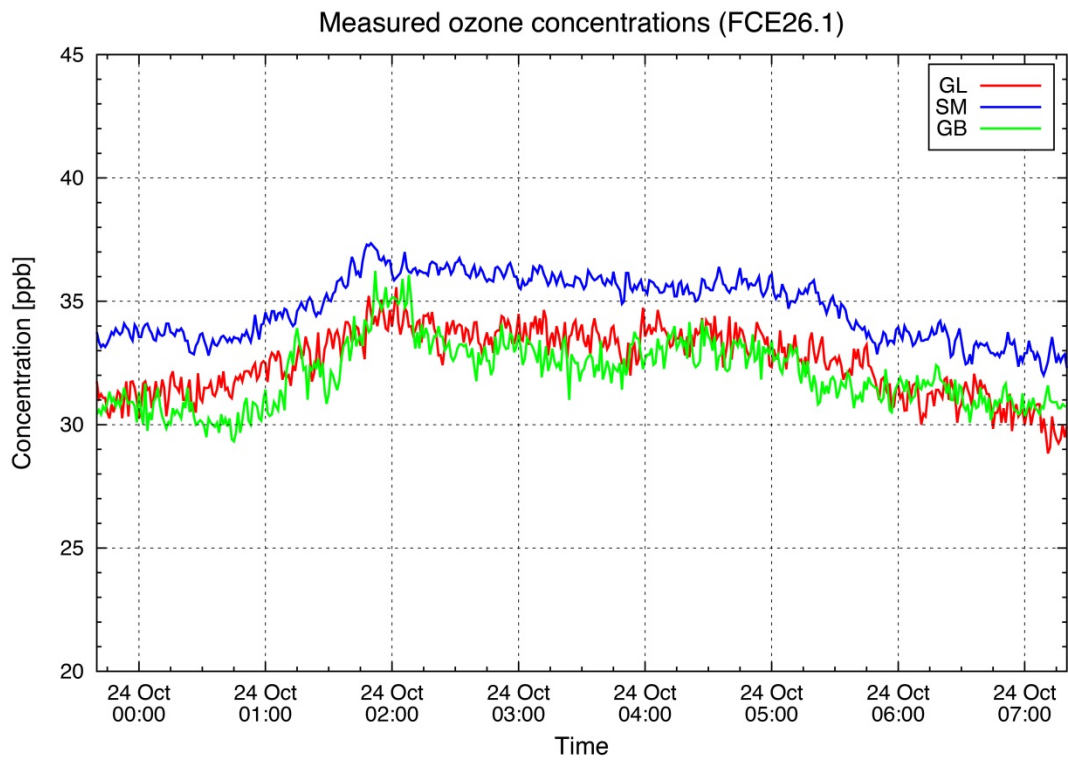


Fig. M 13 Measured ozone concentration over the full event.

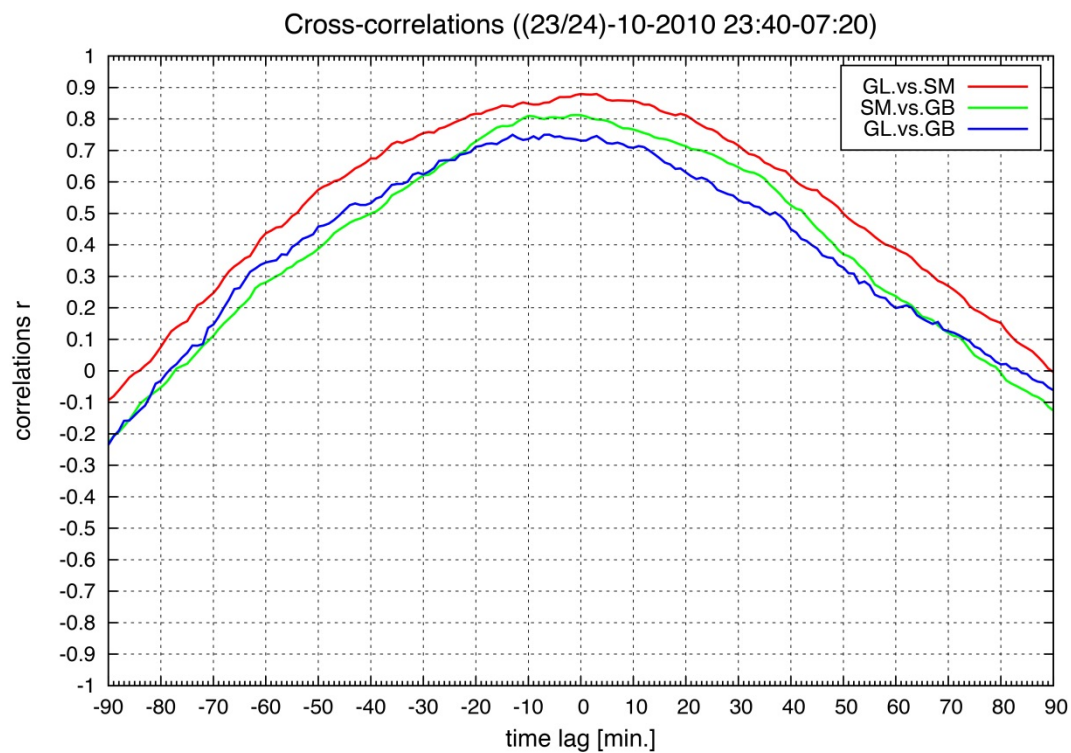


Fig. M 14 Cross-correlation of the full event.

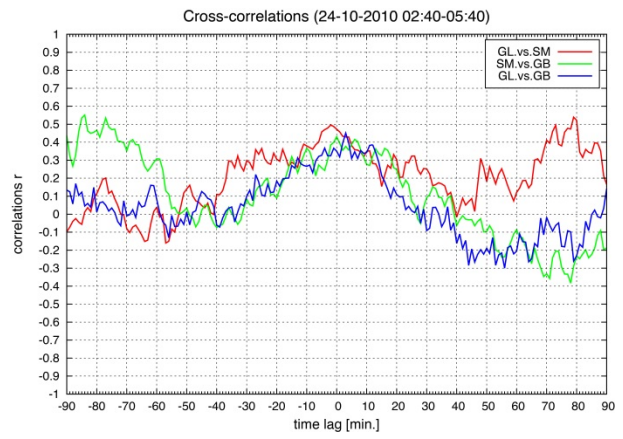
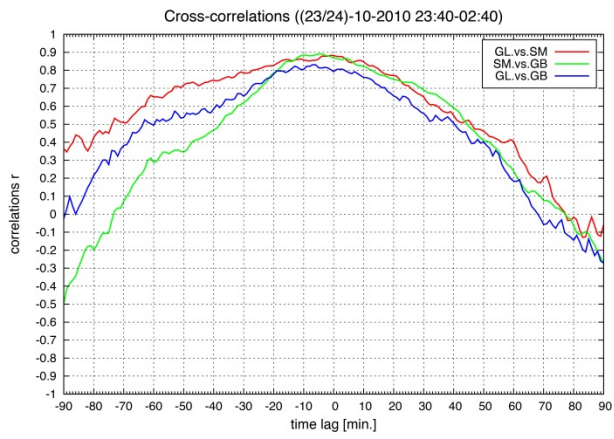


Fig. M 15 Cross-correlation on 23 and 24-10-2010, 23:40 – 02:40 CEST and 02:40 – 05:40 CEST.

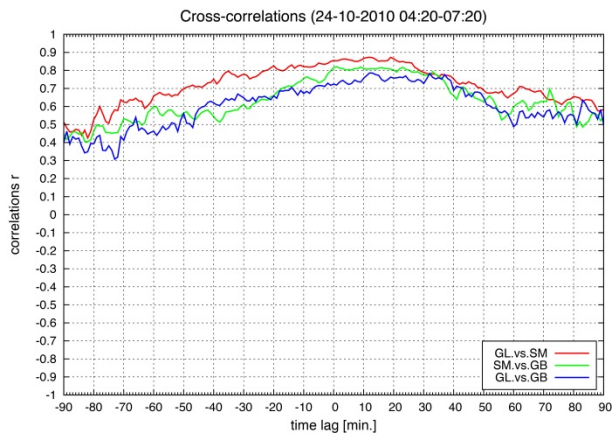


Fig. M 16 Cross-correlation on 24-10-2010, 04:20 – 07:20 CEST.

N: FCE26.2 24.10.10 08:40 – 12:20 (CEST) (offline sampling 09:15 – 11:45 CEST)

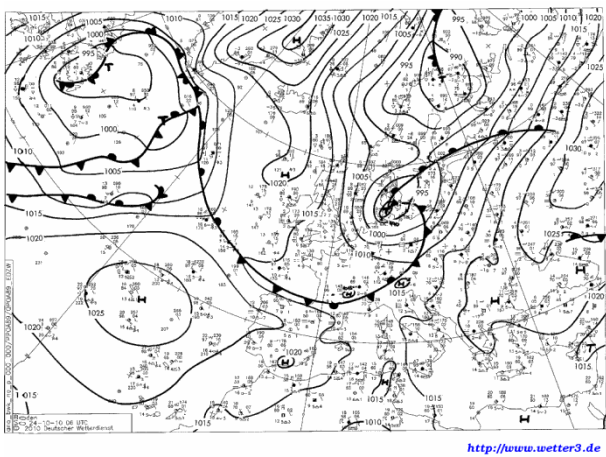


Fig. N 1 Surface weather charts on 24-10-2010, 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

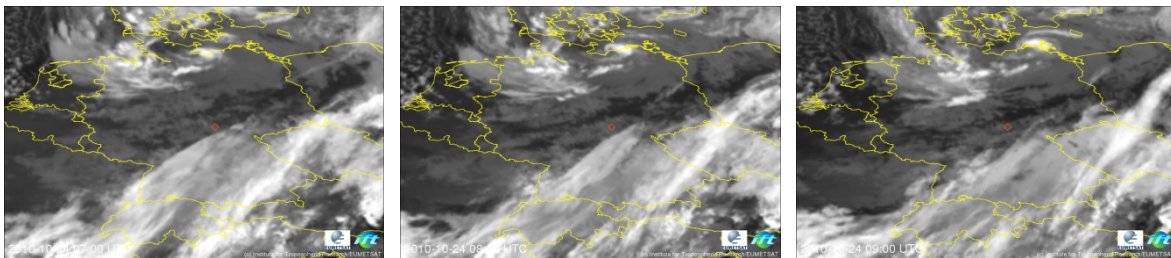


Fig. N 2 IR-satellite picture on 24-10-2010, 07, 08 and 09 UTC (source: ©TROPOS/EUMETSAT).

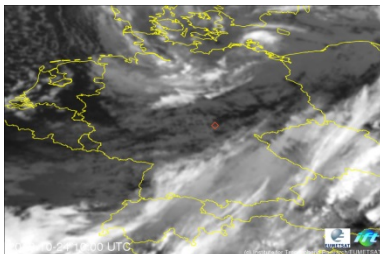


Fig. N 3 IR-satellite picture on 24-10-2010, 10 UTC (source: ©TROPOS/EUMETSAT).

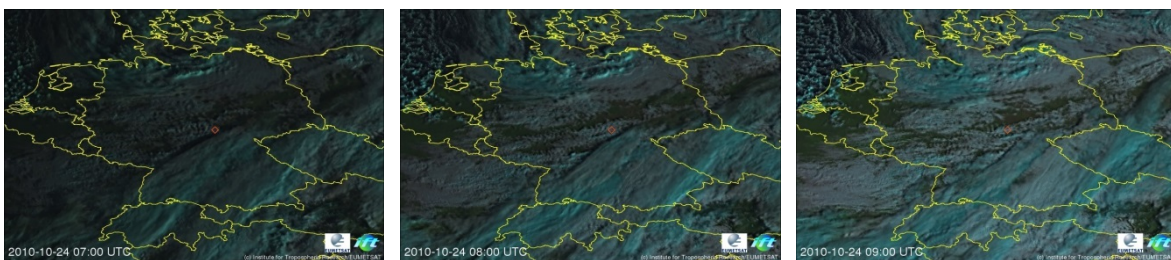


Fig. N 4 VIS-satellite picture on 24-10-2010, 07, 08 and 09 UTC (source: ©TROPOS/EUMETSAT).

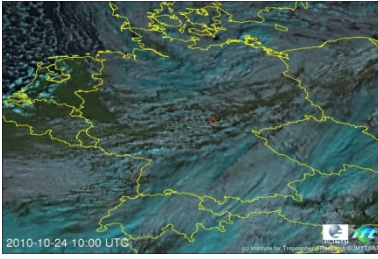


Fig. N 5 VIS-satellite picture on 24-10-2010, 10 UTC (source: ©TROPOS/EUMETSAT).

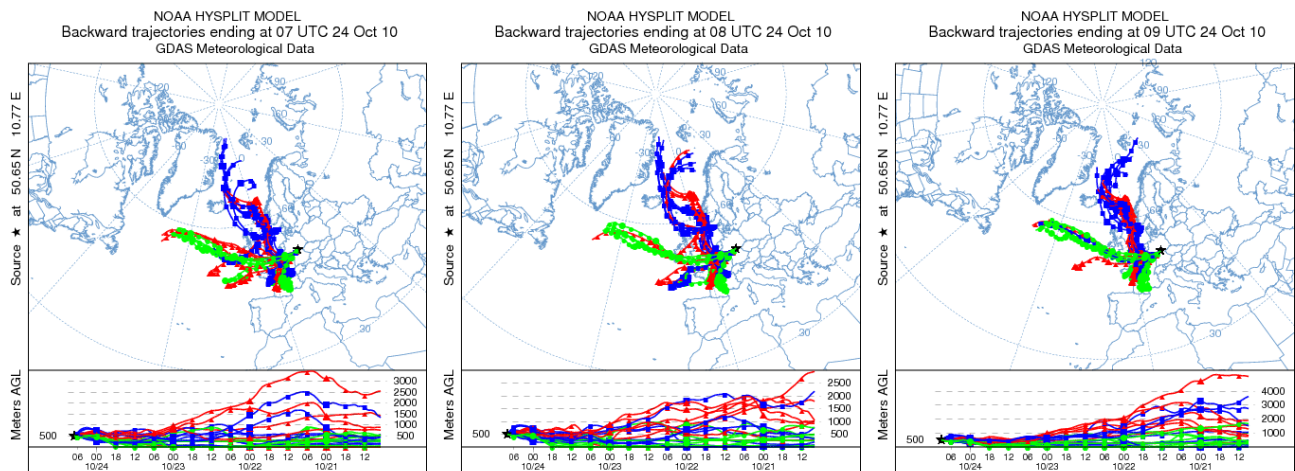


Fig. N 6 Backward trajectories on 24-10-2010, 07, 08 and 09 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

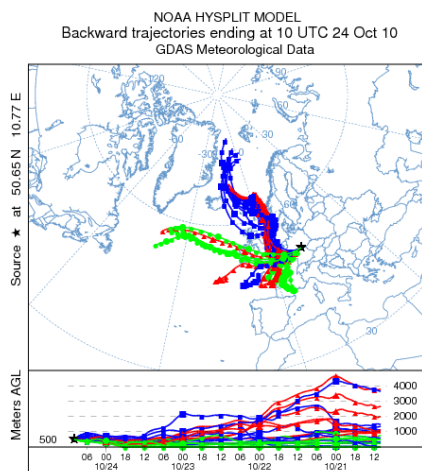


Fig. N 7 Backward trajectories on 24-10-2010, 10 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

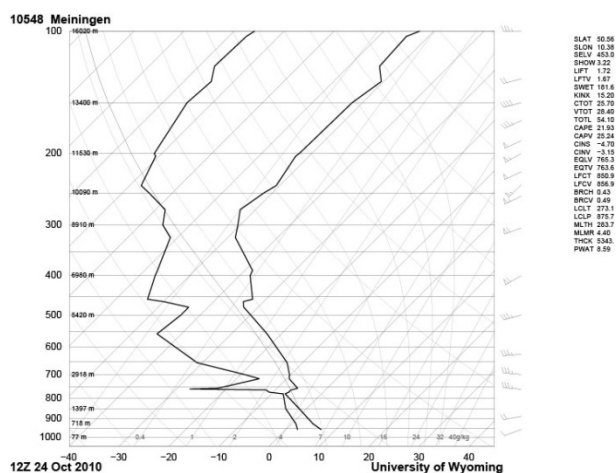


Fig. N 8 Vertical rawinsonde profiles of temperature and dew-point temperature on 24-10-2010, 12 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

Table N 1 Locally measured meteorological data at the summit station Schmücke on 24-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
24-10-2010 08:40	1.7	894.0	0.0	9.1	232.2
24-10-2010 08:50	1.7	894.0	0.0	9.2	228.8
24-10-2010 09:00	1.6	894.0	0.0	9.5	229.7
24-10-2010 09:10	1.6	894.0	0.0	9.5	233.6
24-10-2010 09:20	1.6	894.0	0.2	9.5	225.0
24-10-2010 09:30	1.6	894.1	0.0	9.3	222.6
24-10-2010 09:40	1.6	894.1	0.0	8.7	243.0
24-10-2010 09:50	1.7	894.1	0.0	9.3	237.5
24-10-2010 10:00	1.7	894.3	0.0	10.3	231.5
24-10-2010 10:10	1.6	894.4	0.0	9.6	233.5
24-10-2010 10:20	1.6	894.5	0.0	8.7	237.5
24-10-2010 10:30	1.6	894.6	0.0	9.3	229.2
24-10-2010 10:40	1.5	894.6	0.0	8.8	242.8
24-10-2010 10:50	1.6	894.9	0.0	8.5	240.6
24-10-2010 11:00	1.6	894.9	0.0	9.3	239.2
24-10-2010 11:10	1.4	894.9	0.0	9.0	255.2
24-10-2010 11:20	1.1	895.0	0.0	8.4	253.5
24-10-2010 11:30	0.7	895.0	0.0	8.6	252.3
24-10-2010 11:40	0.6	895.0	0.0	7.7	263.5
24-10-2010 11:50	0.6	895.1	0.0	7.7	240.8
24-10-2010 12:00	1.0	895.3	0.0	7.4	231.8
24-10-2010 12:10	1.3	895.4	0.0	7.8	246.9
24-10-2010 12:20	1.4	895.5	0.0	8.4	247.0

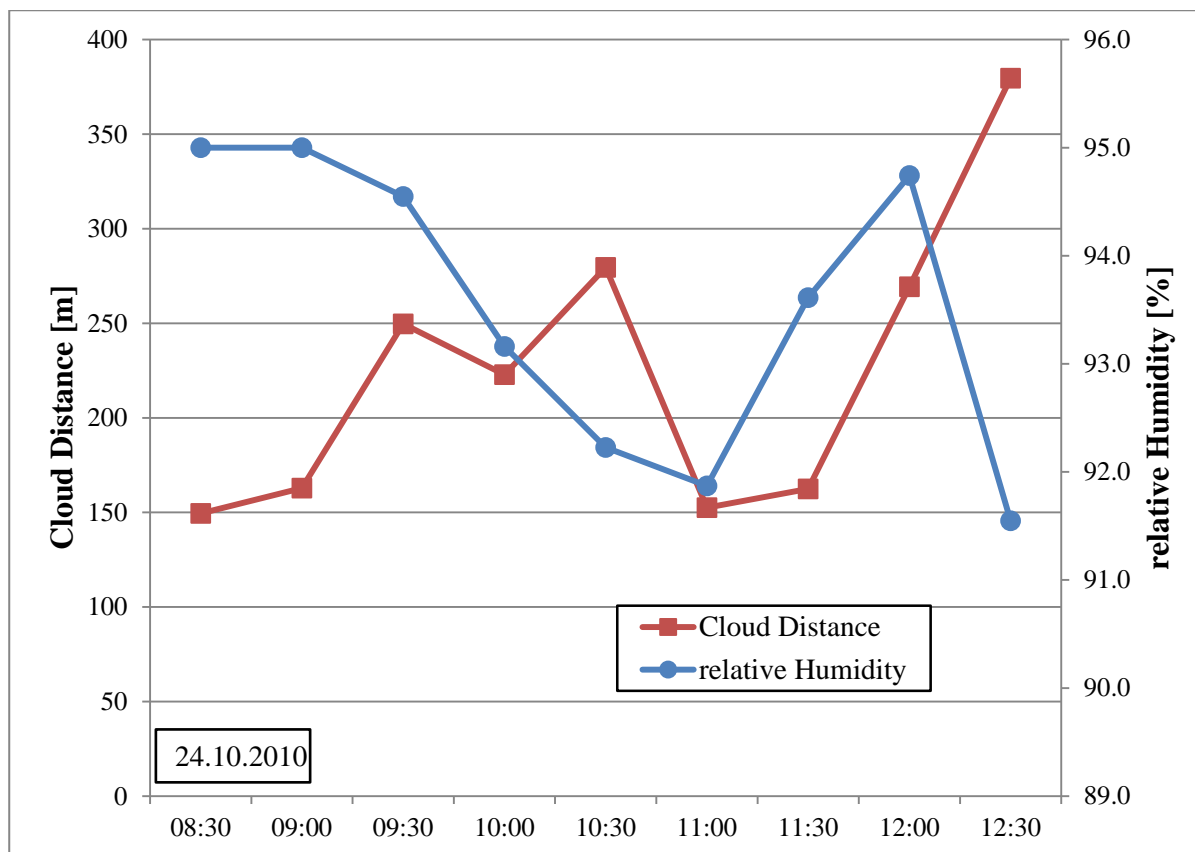


Fig. N 9 Cloud height and relative humidity on cloud event FCE26.2.

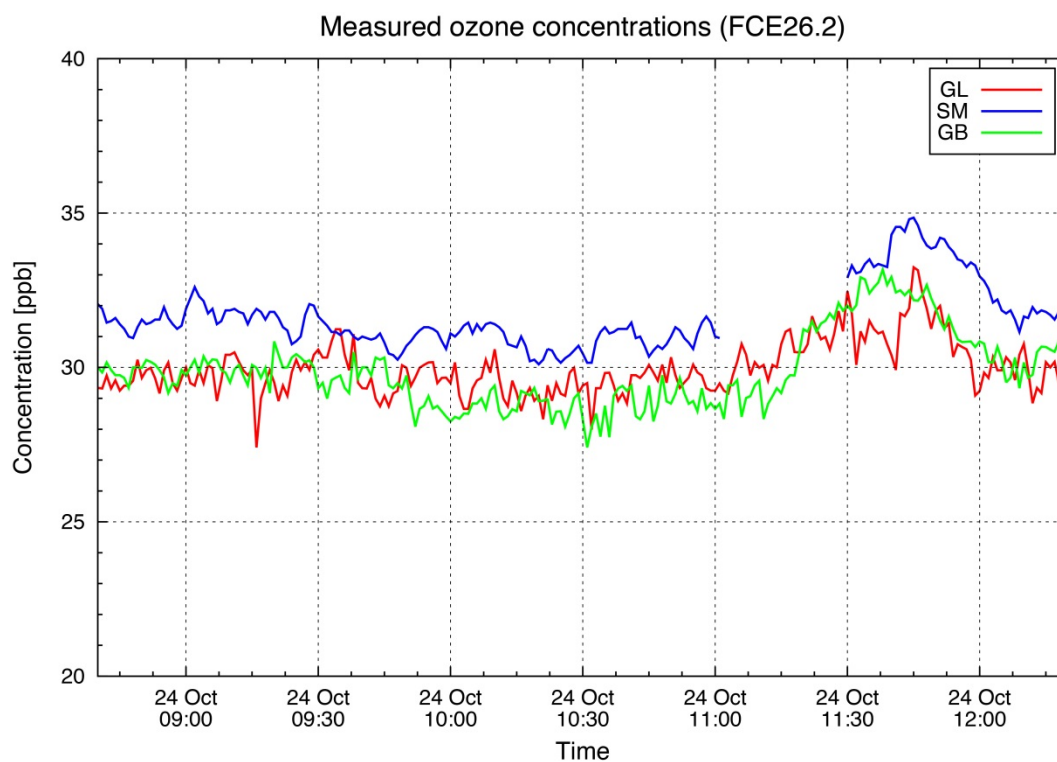


Fig. N 10 Measured ozone concentration over the full event.

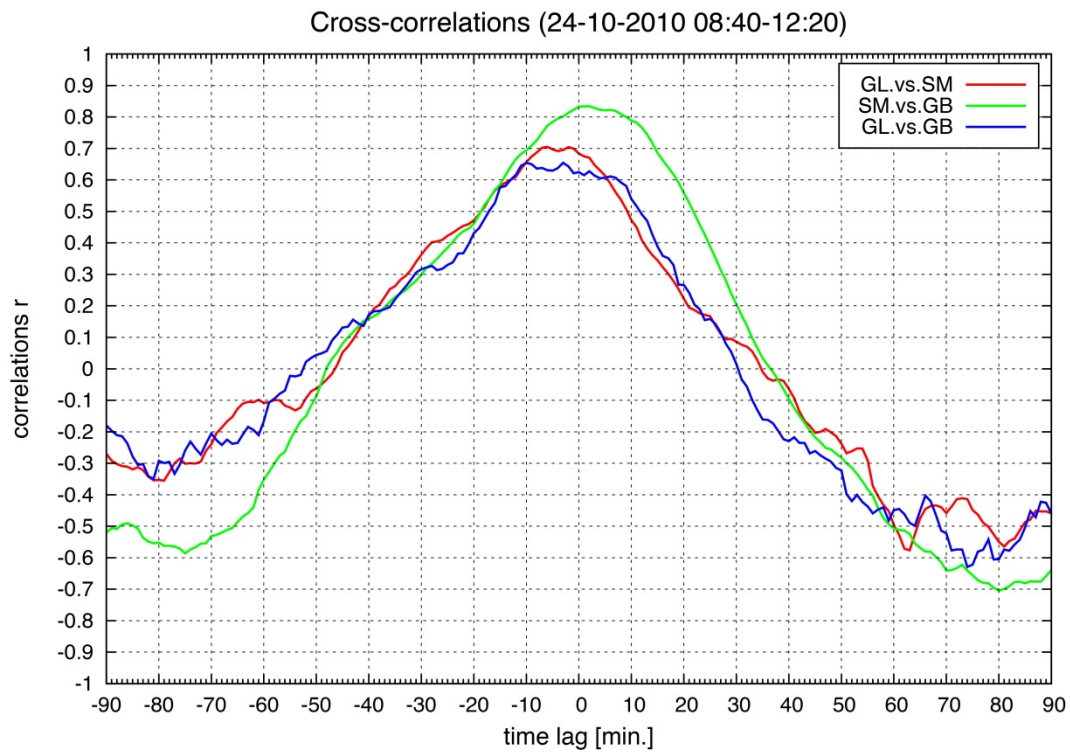


Fig. N 11 Cross-correlation of the full event.