

Electronic Supplement

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Supplementary material on section 2.2: Characterisation of the local flow connectivity using coefficient of divergence (COD) of particles in the Aitken (49 nm) and accumulation mode (217 nm) range

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., Grunig, 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: Detailed meteorological characterisation of the selected FCEs

FCE1.1 (Start: 14-09-2010 11:00 CEST, End: 15-09-2010 01:50 CEST)

The first cloud event FCE1.1 lasted for about 15 hours. Starting at 11 a.m. CEST, the weather situation at the experimental site was characterised by a warm front of a low-pressure system near Iceland bringing slight precipitation ($RR < 1$ mm) to Mt. Schmücke during the first hour of the measurement. In the course of the event, the Low moved south-eastwards leading to a continuously decreasing air pressure at the measurement site. The cloudiness occurring at the summit cannot be labelled as a pure orographic cloud since high clouds covered the area permitting no clear statement. Nevertheless, an orographically induced cloud that was only observed at the summit cannot be excluded since air was advected continuously from WSW to Mt. Schmücke leading to ideal wind conditions with a consistent wind speed of about 8.2 m s^{-1} and stable stratification throughout the whole cloud event. The liquid water content decreased from 0.45 to 0.15 g m^{-3} over the measurement time, conforming to the relative humidity measured at the upwind site, which also decreased. Furthermore, the cloud base height decreased from 150 m above ground at 11 a.m. CEST to 70 m at 1 p.m. CEST and increased again afterwards to about 280 m at 9 p.m. CEST. This corresponds to the findings of the rawinsonde, which indicate a general increasing cloud base height. Within the following 3 hours, the cloud base height fell dramatically to 130 m above ground. Afterwards, high fluctuations in the cloud base height were observed at the measurement site indicating slight precipitation ($RR < 1$ mm) that occurred close to midnight for about 1.5 hours as the cold front of the low-pressure system approached the measurement site. The calculated backward trajectories and corresponding trajectory analysis (see Fig. S1 and the corresponding Figures in the ESM section A) indicate that the air mass was advected in a cyclonic bend and was (time-wise) in nearly equal shares characterised by the North Atlantic as well as agricultural and natural vegetation regions in Western Europe during the measurement period. However, the air mass could be also slightly influenced by urban emissions, e.g. due to the possible passage of Paris.

FCE1.2 (Start: 15-09-2010 03:00 CEST, End: 15-09-2010 06:20 CEST)

Strong postfrontal advection of Greenlandic polar air (mP) introduced a cyclonic west circulation at Mt. Schmücke and led to temporary cloud dispersal. But the following rather short cloud event (duration: $3 \frac{1}{3}$ hours) was again characterised by slight precipitation ($RR < 0.4$ mm at all sites), increasing LWC from 0.05 to 0.28 g m^{-3} as well as slightly stable thermal stratification. The wind blew steadily from SW (231°) with moderate wind speeds of 9.6 m s^{-1} . The air mass was mainly advected over the North Atlantic Ocean and agriculturally used areas (see Fig. S1). During the event period, the cloud base height continuously changed between 150 and 300 m .

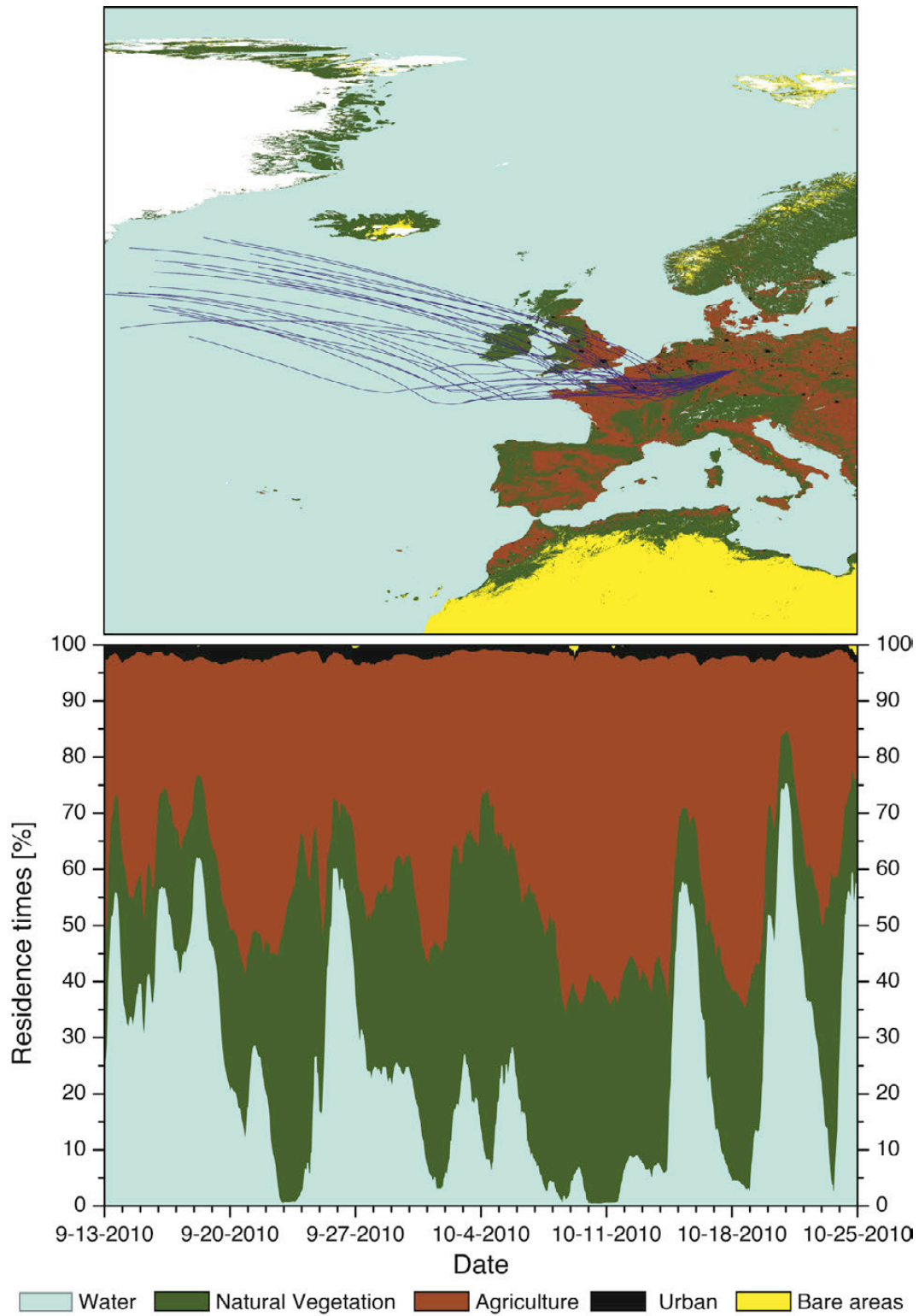


Figure S1. Depiction of the calculated ensemble backward trajectories using the NOAA HYSPLIT model arriving at 09-14-2010 16 UTC at Mt. Schmücke (top) and the calculated residence times of all backward trajectories over different area categories throughout the HCCT-2010 campaign. Land use data is based on the Global Land Cover 2000 project of the European Commission Joint Research Centre (GLC2000 database, <http://bioval.jrc.ec.europa.eu/products/glc2000/glc2000.php>, see also van Pinxteren et al. (2010) for further details).

FCE2.1 (Start: 15-09-2010 23:00 CEST, End: 16-09-2010 02:00 CEST)

Due to the cyclonic west circulation, Greenlandic polar air (mP) was slowly advected to the measurement site resulting in smaller but slightly increasing wind speeds of about 8.7 m s^{-1} from WSW (240°) during FCE2.1 (duration: 3 hours). The air mass mainly crossed the English Channel and Northern France indicating smaller continental impact (see Fig. S1). From 11 p.m. CEST on, the cloud base height decreased from 380 to 280 m above ground and increased again during the event to 420 m. The LWC showed a maximum at midnight of 0.25 g m^{-3} , decreasing in both directions to about 0.05 g m^{-3} . The satellite images imply that the present cloud was probably not purely orographically induced, but advected by the large-scale westerly flow over Central Europe. No precipitation occurred during the three hours of the selected cloud event and stable stratification occurred.

FCE4.1 (Start: 16-09-2010 13:10 CEST, End: 16-09-2010 15:00 CEST)

During the day of September 16th, the general weather situation did not change distinctively. The occlusion of a small low-pressure system over the Skagerrak brought slight precipitation ($RR < 0.8 \text{ mm}$) to the site during the event (duration: 2:50 hours). The cloud base height changed from 350 m to a lower cloud (150 m) occurring at Mt. Schmücke around 2 p.m. CEST and cloud dissipation as well as stopping precipitation at the end of the measurement. The wind speed of about 7.4 m s^{-1} decreased somewhat throughout the event coming from slightly changing directions of SW (220°) to WSW (250°), conforming to rather unstable backward trajectories that originate in Atlantic regions from the Arctic circle to the Azores. The rawinsonde data indicate an unstable thermal stratification. The LWC decreased from about 0.2 to 0.1 g m^{-3} throughout the cloud period.

FCE5.1 (Start: 16-09-2010 21:40 CEST, End: 16-09-2010 23:50 CEST)

In the evening of the same day another experimental period started (duration: 2:10 hours). Still high-reaching cold marine air (mP) approached Mt. Schmücke in a cyclonic manner. Slightly smaller wind speeds were observed (6.3 m s^{-1}) from WSW (240°). The cloud base height was 150 to 250 m above ground with constantly high LWC in the cloud of 0.3 g m^{-3} during the event. No precipitation occurred. The trajectory analysis indicates a mainly oceanic influenced air mass and rather unstable trajectories originating from westerly directions. The analysis of the rawinsonde data indicates that the lower atmospheric layers were slightly stable stratified.

FCE7.1 (Start: 24-09-2010 21:10 CEST, End: 25-09-2010 00:50 CEST)

During the day, the general weather situation changed from high-pressure conditions to a cyclonically characterised weather situation. The strengthening low-pressure system over the North Sea advected aged Greenlandic polar air (mP) to the measurement site leading to wind speeds of $5\text{--}8 \text{ m s}^{-1}$ from WSW (228°) at Mt. Schmücke. Based on the trajectory analysis (see Fig. S1), the advected air mass was mainly characterised by natural vegetation and to smaller amounts by agricultural land use and water surfaces resulting from the fast advection of the air mass during the last 96 hours mainly over France and partly from the Eastern Atlantic to the measurement site. Under stable thermal stratification conditions, an orographic cloud (see Fig. S2) occurred at the summit with a cloud base height of about 220 m above the upwind site and an increasing LWC of 0.1 to 0.3 g m^{-3} . No precipitation was observed during the event of 3:40 hours duration.

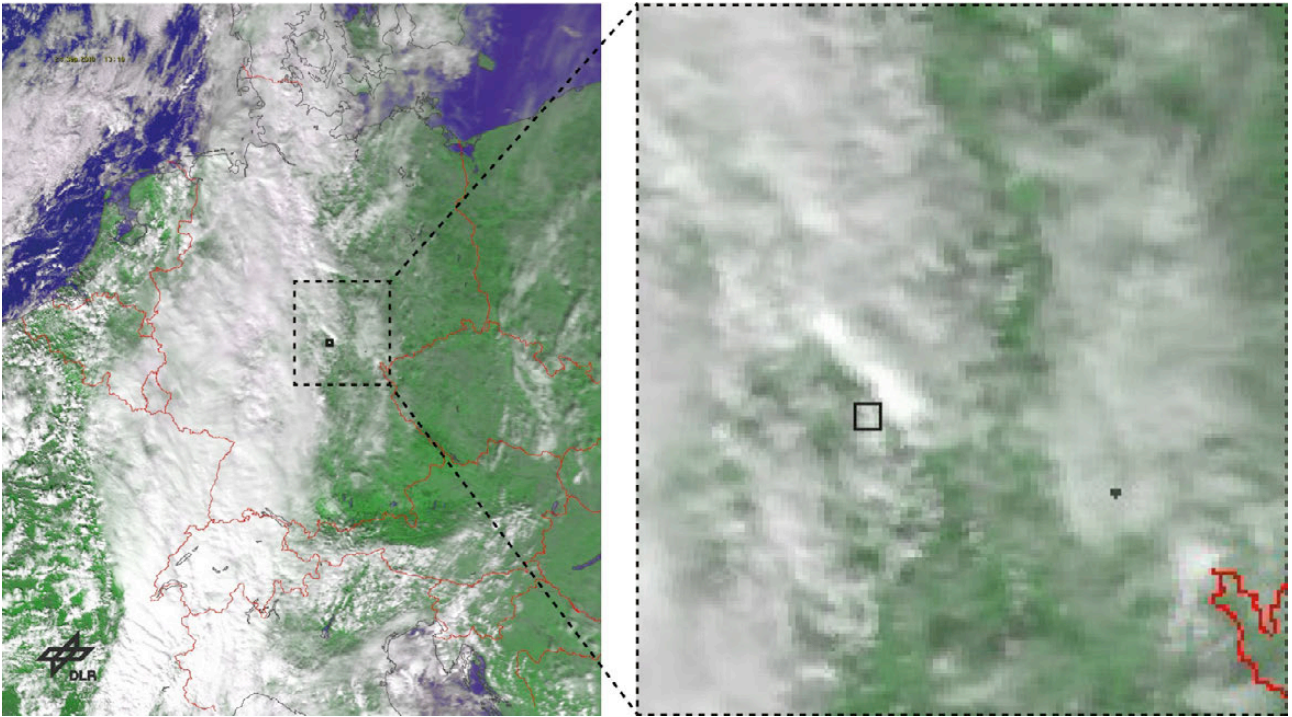


Figure S2. Satellite picture (VIS channel) demonstrating the orographic cloud at Mt. Schmücke (source: DLR). The square in the Figure marks the measurement site.

FCE11.2 (Start: 01-10-2010 20:50 CEST, End: 02-10-2010 03:10 CEST)

The weather conditions during this period (duration: 6:20 hours) were characterised by an occlusion prior to the frontal system of a low-pressure system over the North Atlantic that only becomes important for the next event. The occlusion could barely move north-eastwards because of the blocking anticyclone over Scandinavia. The air mass was mainly continentally influenced and fast advected over France passing both agriculture and natural vegetation areas. The measured wind data at Mt. Schmücke showed a stable south-westerly flow (222°) with comparably low wind speeds of 3.7 m s^{-1} . The observed cloud at the summit was characterised by a changing the base height from 120 to 200 m. The cloud type cannot be confirmed for sure, but an occlusion-related cloud seems plausible. The LWC doubled from 0.25 to 0.5 g m^{-3} throughout the experiment and no precipitation was observed.

FCE11.3 (Start: 02-10-2010 07:10 CEST, End: 03-10-2010 00:30 CEST)

October 2nd was characterised by a low depression (965 hPa) over south of Iceland advecting continental tropical air from south-west (220°) to the measurement site with varying wind speed of $4\text{-}9 \text{ m s}^{-1}$ (max. at 5 p.m. CEST). At the beginning of the experiment, i.e. the first 1.5 hours, the warm front caused slight precipitation ($RR < 0.5 \text{ mm}$) at Mt. Schmücke. The cloud base height varied between 100 and 250 m at a constant LWC of 0.32 g m^{-3} . RH slightly increased from 96 % to 98 % at the upwind site. The air mass was permanently influenced by agriculturally used areas or natural vegetation. Since also higher clouds occurred at the measurement site, the type of the lower level cloud cannot be confirmed for sure. However, a partly orographically induced cloud is possible (see ESM section H). The rawinsonde data shows stable thermal stratification throughout the event. The experiment lasted for 17:20 hours and provides altogether adequate conditions.

FCE13.3 (Start: 06-10-2010 06:50 CEST, End: 07-10-2010 01:00 CEST)

An extended measuring period with good meteorological conditions was on October 6th/7th. The cloud event lasted 15 hours. The weather situation during that time was characterised by a high over Russia and a low-pressure area over Iceland. The Schmücke area stayed in a sector of warm air with weak pressure gradients causing low wind speeds less than 4 m s^{-1} at Mt. Schmücke. During the measuring period, the high-pressure system extended slowly into the Schmücke area and the sector of warm air diminished gradually. The backward trajectory analysis (see ESM section I) shows a large scattering between the different ensemble runs. Depending on the starting point of the trajectory, there is a high variability in the direction of the trajectory reaching from south-easterly over southern and western to north-easterly directions. Therefore, it cannot clearly be verified whether the air mass was more marine or continental influenced. The most likely trajectory moved westerly from the Atlantic Ocean towards the UK, then made a loop over the Bay of Biscay and approaches the Schmücke area from the southwest passing France. The south-western airflow was stable throughout the whole selected period. The rawinsonde data shows rather stable thermal stratification conditions throughout the event. From the VIS satellite pictures, an orographic cloud effect can be clearly seen. A bank of cloud filled wide regions of Thuringia and Bavaria and a sharp edge is seen at the mountain ridge of the Thuringian Forest (see Fig. S3). The cloud height varied between 100 and 200 m throughout the cloud event. The cloud was characterised by high LWC values between 0.3 and 0.55 g m^{-3} except for a short period between 11 a.m. and 3 p.m. CEST, where the LWC decreases to values down to 0.1 g m^{-3} (mean LWC 0.32 g m^{-3}).

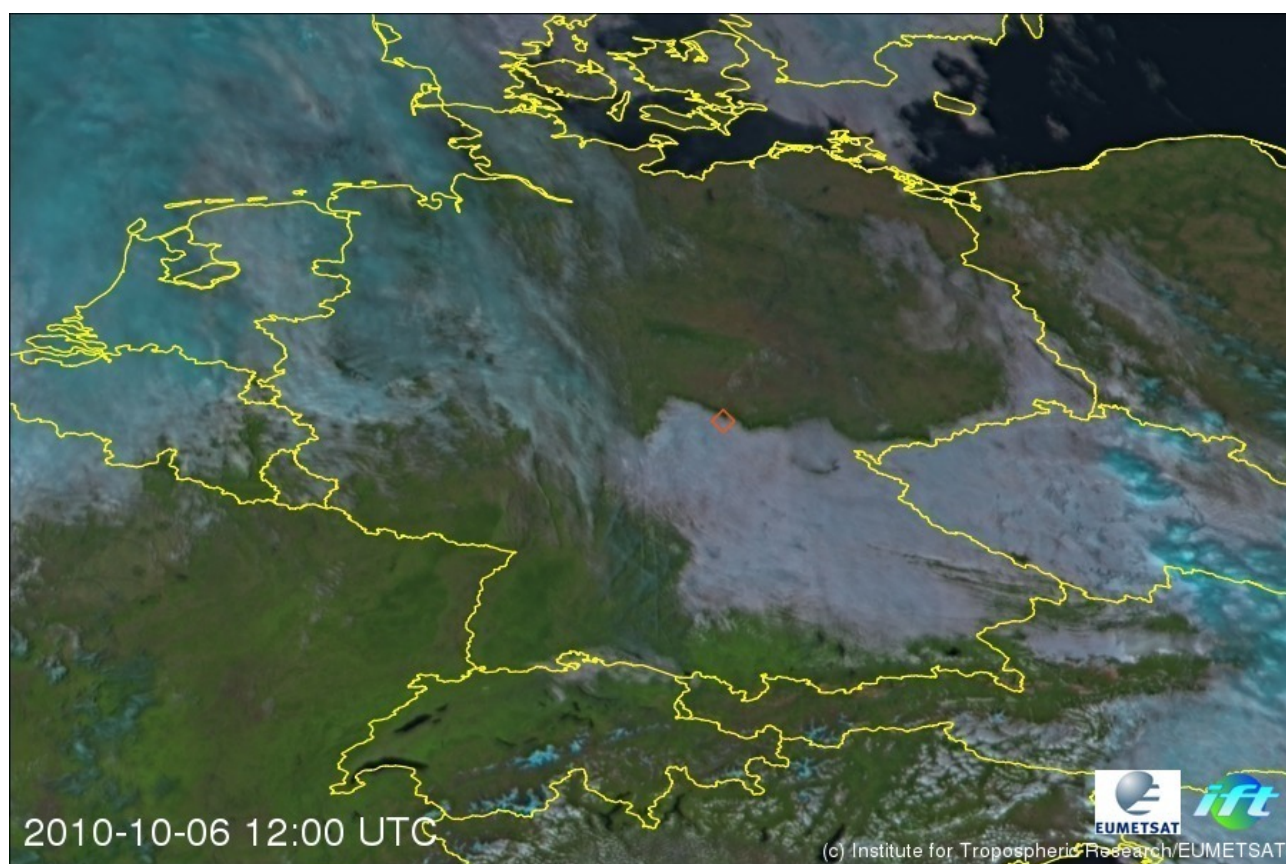


Figure S3. Satellite picture (VIS channel) of the cloud coverage over Germany (© TROPOS/EUMETSAT). The [diamond](#) in the Figure marks the measurement site.

FCE22.0 (Start: 19-10-2010 01:50 CEST, End: 19-10-2010 09:00 CEST)

During this 7-hour period, the Schmücke area lay in a trough while a high-pressure bridge began to build up in the South of Germany. Temperatures stayed constantly below the freezing point during the period. There was an occlusion directly over the Schmücke area. Moreover, a cold front from a low-pressure system with centre over southern Norway passed Mt. Schmücke at the end of the measuring period bringing light precipitation and low clouds. The cloud event was characterised by constant south-western flow conditions (mean wind direction: 233°) with moderate wind speeds (mean: 5.1 m s^{-1}) and LWC levels around 0.2 g m^{-3} . The rawinsonde data shows rather stable thermal stratification conditions. The cloudiness at Mt. Schmücke was caused by the occlusion and frontal system rather than by pure orographic lifting. The backward trajectory analysis (see ESM section J) shows a large scattering between the different ensemble runs. In general, most of the trajectory shows an advection of cold air from northern directions to the North of France and a subsequent south-western advection to the experimental area. Moreover, the backward trajectory analysis revealed that the arriving air mass was mainly continentally influenced and has passed mainly both agriculture and natural vegetation areas.

FCE22.1 (Start: 19-10-2010 21:10 CEST, End: 20-10-2010 02:30 CEST)

There were slight changes in the synoptic situation compared to the event FCE22.0. Germany has become more influenced by low pressure with the centre of the low-pressure system over Germany. Moderate winds were present at Mt. Schmücke, which periodically tend to be too westerly for an ideal setup of the experiment. The general wind direction at Mt. Schmücke changed towards westerly direction (around 260°), e.g. to the upper limit of the predefined wind sector. The analysis of the backward trajectories shows stable westerly flow conditions for most of the ensemble members. Due to the westerly advection, the air mass passed both maritime and continental (agriculture/natural vegetation) areas. The data of the rawinsonde shows slightly stable thermal stratification conditions. The measured LWC increased from 0.18 to 0.3 g m^{-3} within the first 30 minutes and stayed rather constantly around that value afterwards with slightly higher values at the end of the period around 0.37 g m^{-3} . The cloud height from the ceilometer data in Goldlauter varies between 100 and 190 m, whereas the relative humidity at the upwind site stayed rather constant. On the IR satellite images (see ESM section K), dark-grey and uniform areas can be mostly seen, which indicate the presence of lower stratiform cloudiness at the experimental site.

FCE24.0 (Start: 21-10-2010 22:10 CEST, End: 22-10-2010 10:00 CEST)

The general synoptic situation was characterised by a high-pressure area in the south of Germany and a low-pressure system passing Denmark and the South of Sweden. The measurement area lied in a frontal zone with somewhat stronger pressure gradients causing mean wind speeds up to 6 m s^{-1} from south-western directions (mean 241°) at Mt. Schmücke ideally for the experimental design. The analysis of the backward trajectories shows for all ensemble members stable advection from Greenland to France and subsequently to the measurement site. Due to the advection path, the air mass passed both maritime and continental (agriculture/natural vegetation) areas (see Fig. S1). The data of the rawinsonde shows quite stable thermal stratification conditions (see ESM section L). There was a cloud throughout the whole period with LWC values between 0.04 and 0.25 g m^{-3} . It is noted that no offline sampling was performed as the temperature was below the freezing point. Most of the available IR satellite images (see ESM section L) illustrate a dark-grey and uniform cloud orographic pattern that indicate a relative warm cloud top and thus lower stratiform

cloudiness at Mt. Schmücke. Furthermore, slight precipitation ($RR_{SM} = 0.14$ mm) was observed during the event, which last for nearly 12 hours duration.

FCE26.1 (Start: 23-10-2010 23:40 CEST, End: 24-10-2010 07:20 CEST)

During FCE26.1 a low pressure system passed the Schmücke area. The centre over Great Britain and the North Sea moved quickly to northern Germany, Denmark and southern Sweden. Initially, the Mt. Schmücke area lied in the warm sector of the low-pressure system. The cold front passed the experimental site bringing light precipitation between 0:30 and 3:00 a.m. CEST. Postfrontal precipitation has been also observed around 5:30 a.m. CEST. The analysis of the trajectories shows a high variability in the course of the distinct ensemble members. The analysis of the trajectory residence times shows that the air mass was advected over both maritime and continental areas. The wind blew from south-westerly directions. The wind speed, however, was quite high with mean wind speeds up to 13 m s^{-1} at the beginning of the cloud period. The data of the rawinsonde shows only less stable thermal stratification conditions. The LWC gradually increased from 0.07 g m^{-3} to about 0.2 g m^{-3} within the first hour and stayed almost constant thereafter. The cloud height decreased from 300 m to 160 m within the first two hours, varies between 230 and 130 m until the end of the measuring period. However, due to the frontal system, a pure orographic cloud was not present. Light precipitation caused an interruption of the measuring period until 8:40 a.m. CEST, where the FCE26.2 was started.

FCE26.2 (Start: 24-10-2010 08:40 CEST, End: 24-10-2010 12:20 CEST)

After the passage of the cold front, wind speed remained high at values around 9 m s^{-1} still from south-westerly directions. The LWC decreased from about 0.2 to 0.06 g m^{-3} . The cloud base is found at about 200 m throughout the measuring period and is lifted to 350 m with the last hour of the measurement period. Light postfrontal precipitation was observed between 10:50 and 11:40 CEST. The analysis of the trajectories shows a significant variability with half of the ensemble members coming from western directions and half of the members coming from northern directions.

Supplementary material on section 3.6: 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

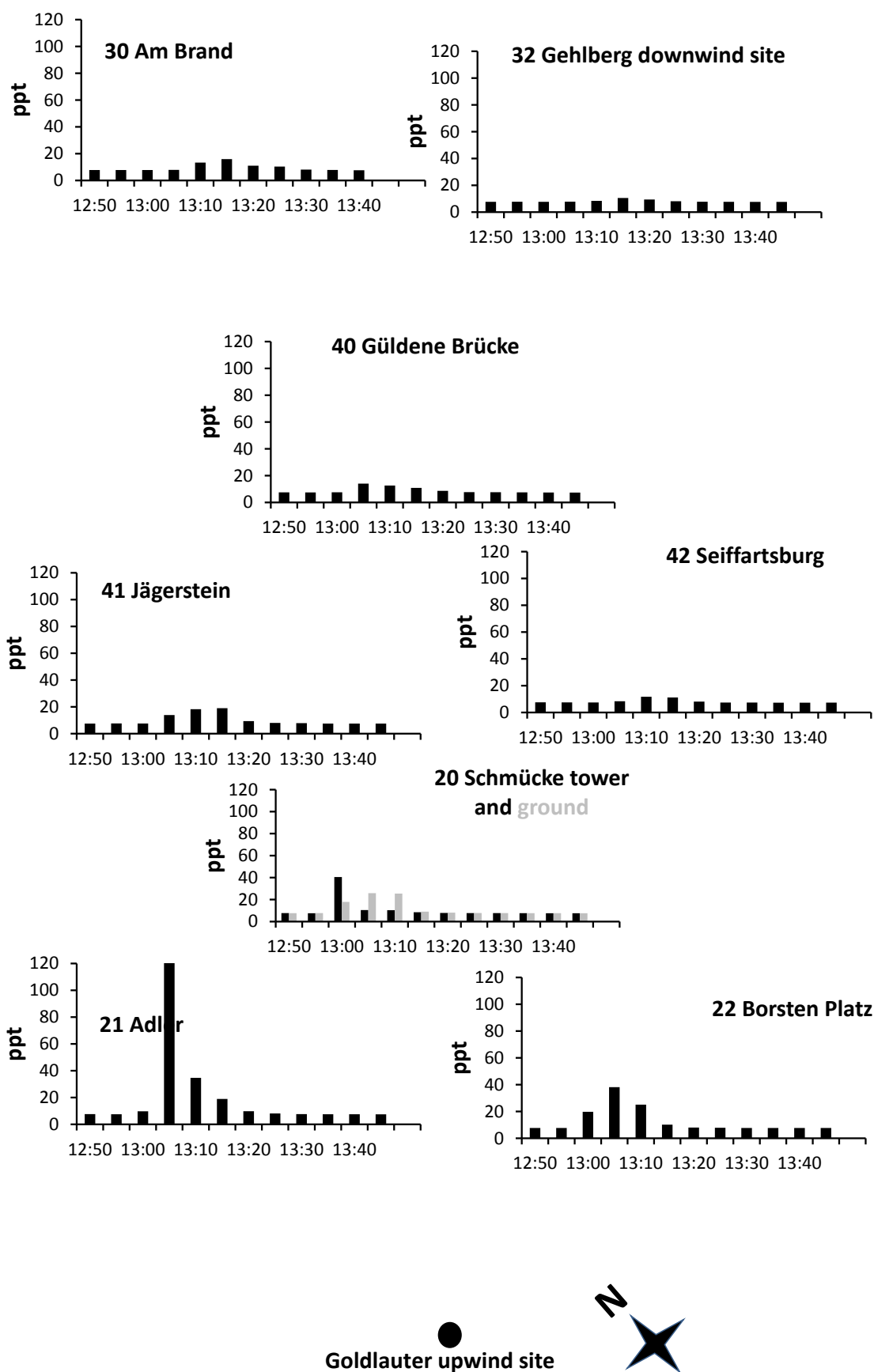


Fig. S4 SF₆ time series at different sites during tracer experiment 2 (23-09-2013). Air flow not connected.

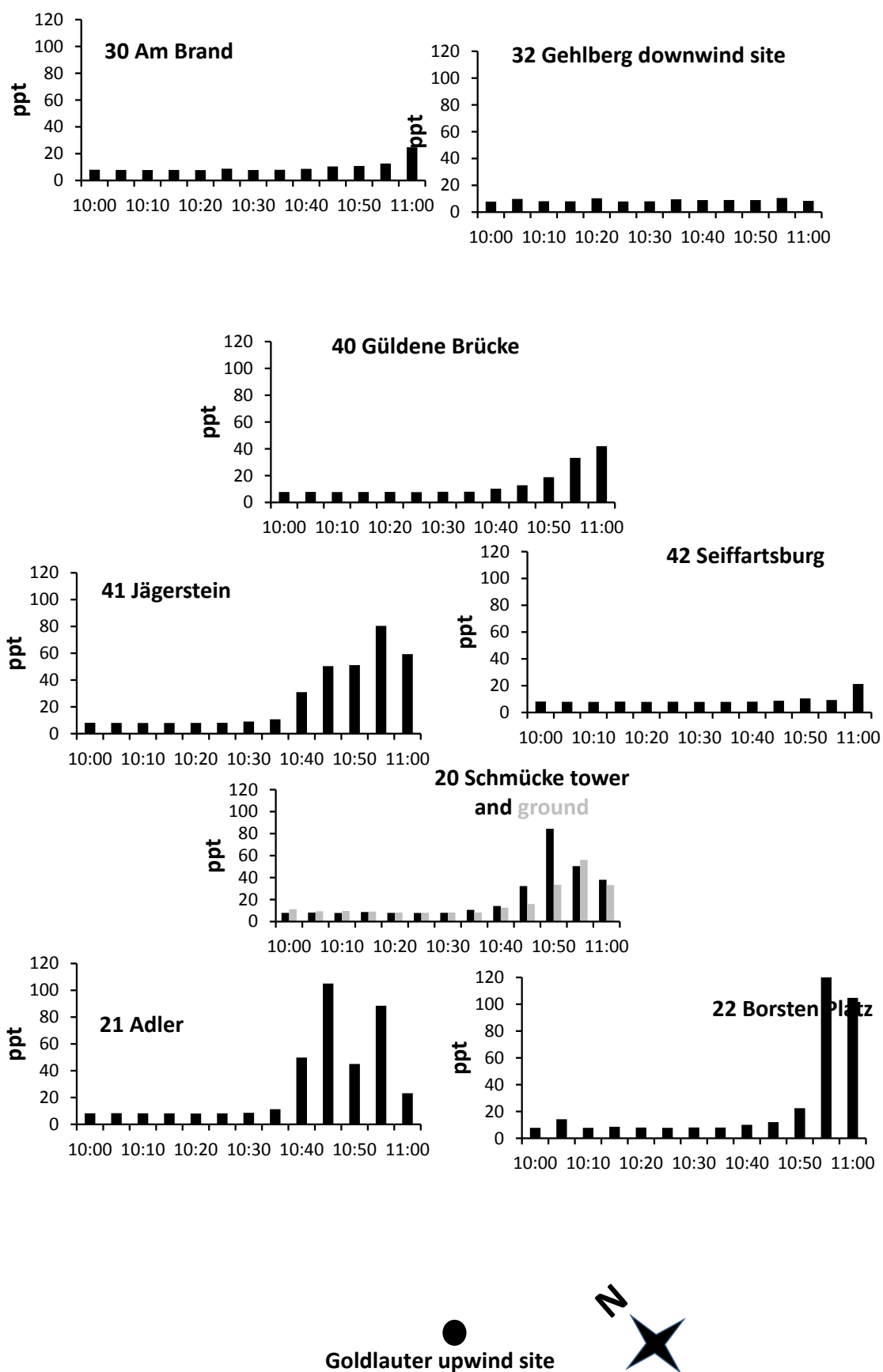


Fig. S5 SF₆ time series at different sites during tracer experiment 4 (23-10-2013). Air flow not connected.

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)

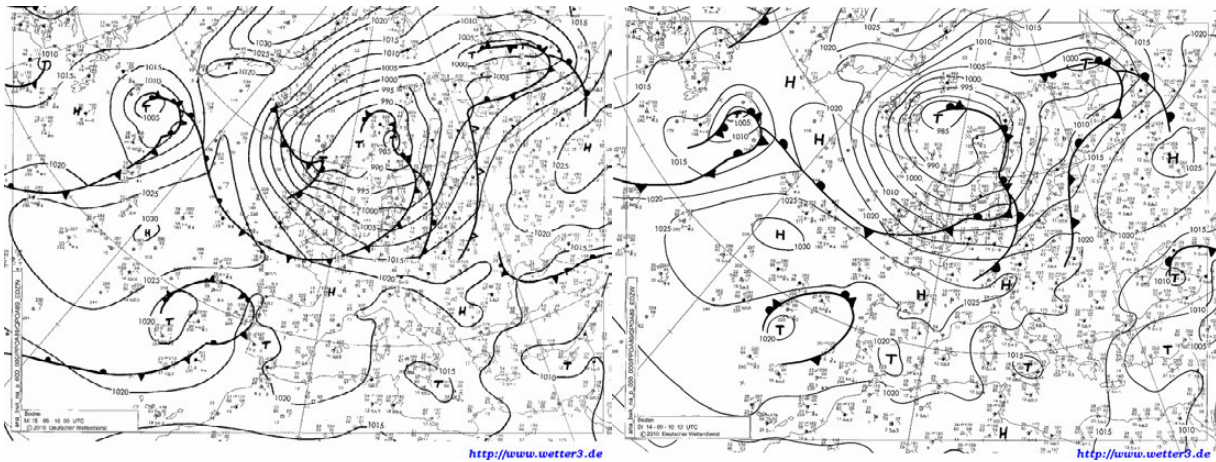


Fig. A 1 Surface weather charts on 14-09-2010, 12 UTC and on 15-09-2010, 00 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

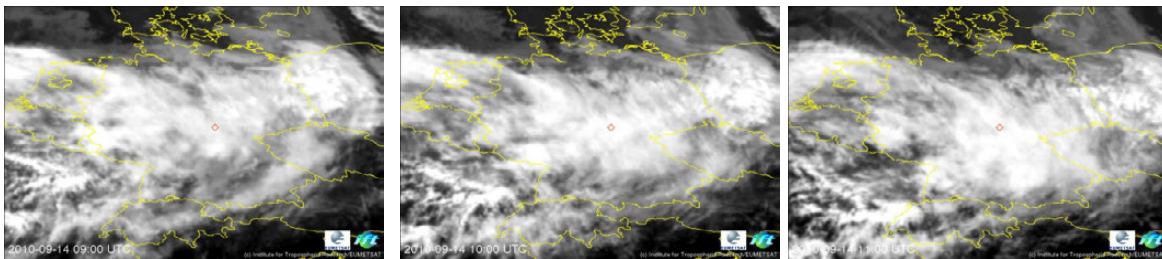


Fig. A 2 IR-satellite picture on 14-09-2010, 09, 10 and 11 UTC (source: ©TROPOS/EUMETSAT).

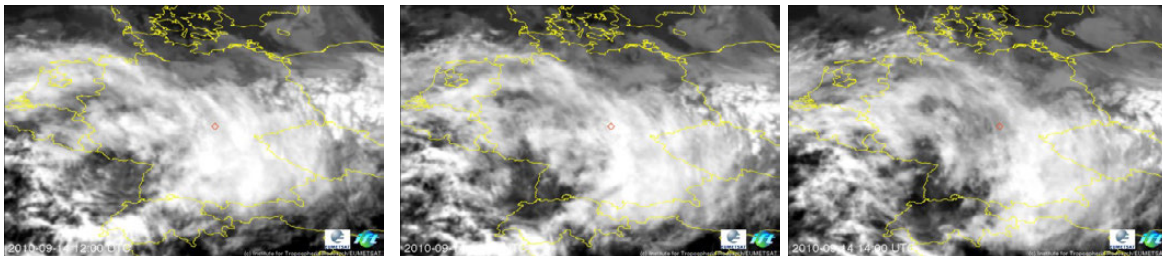


Fig. A 3 IR-satellite picture on 14-09-2010, 12, 13 and 14 UTC (source: ©TROPOS/EUMETSAT).

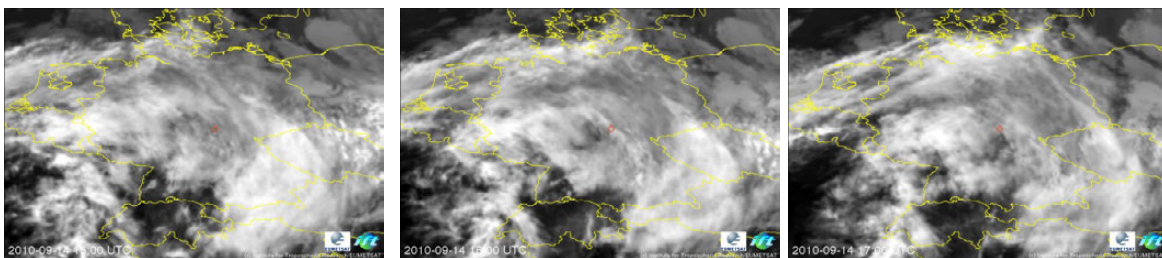


Fig. A 4 IR-satellite picture on 14-09-2010, 15, 16 and 17 UTC (source: ©TROPOS/EUMETSAT).

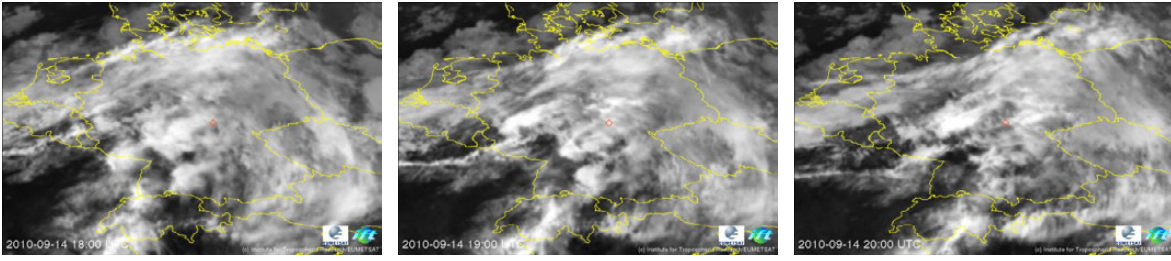


Fig. A 5 IR-satellite picture on 14-09-2010, 18, 19 and 20 UTC (source: ©TROPOS/EUMETSAT).

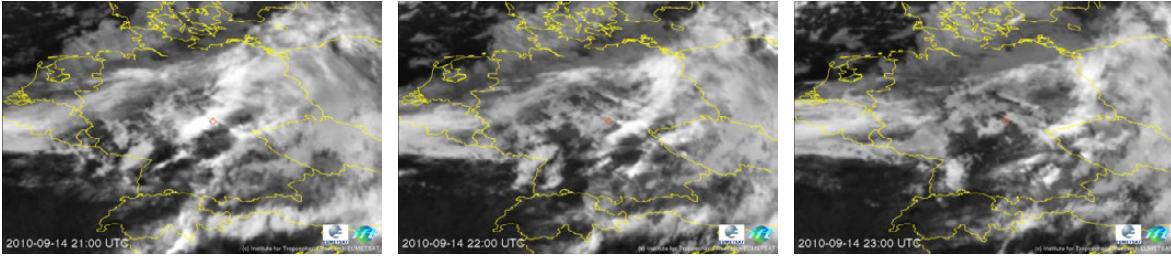


Fig. A 6 IR-satellite picture on 14-09-2010, 21, 22 and 23 UTC (source: ©TROPOS/EUMETSAT).

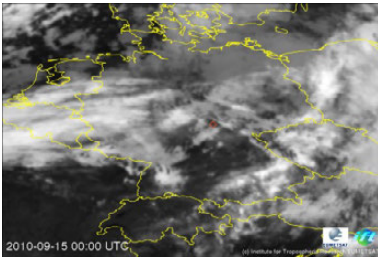


Fig. A 7 IR-satellite picture on 15-09-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

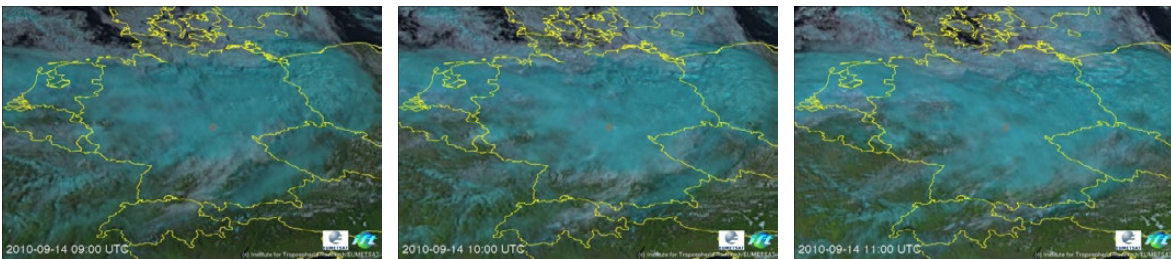


Fig. A 8 VIS-satellite picture on 14-09-2010, 09, 10 and 11 UTC (source: ©TROPOS/EUMETSAT).

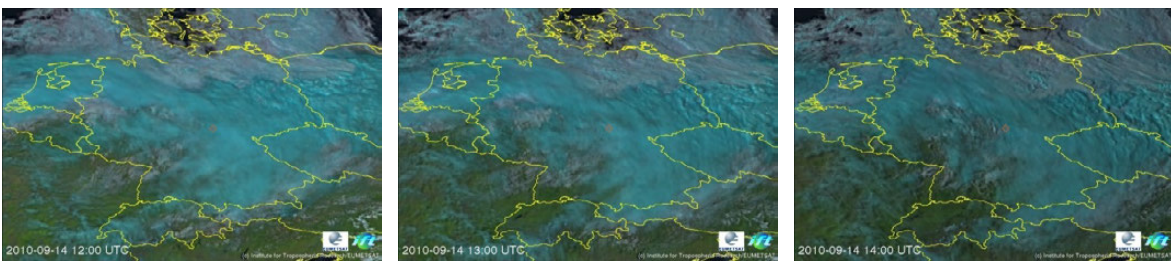


Fig. A 9 VIS-satellite picture on 14-09-2010, 12, 13 and 14 UTC (source: ©TROPOS/EUMETSAT).



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

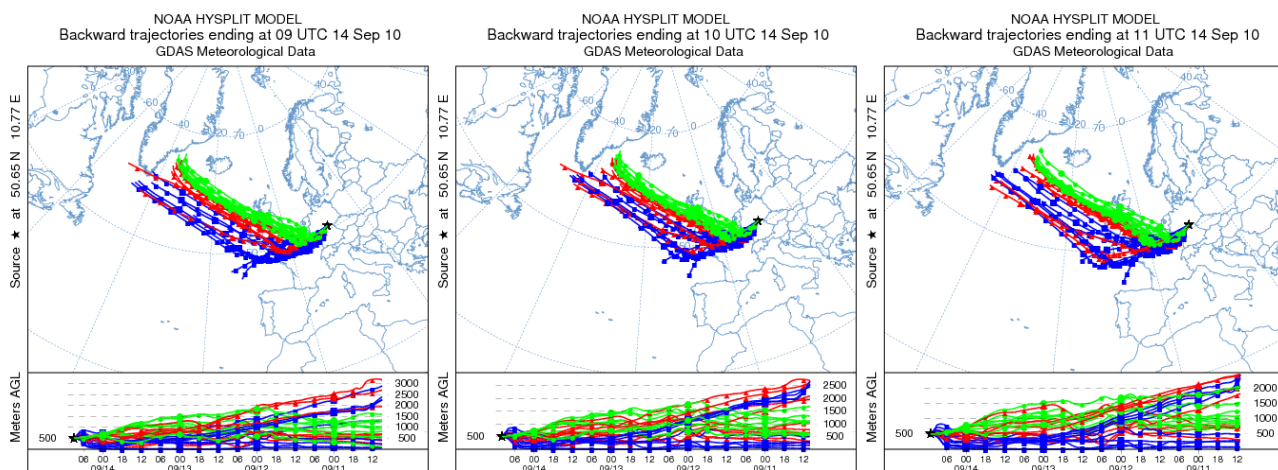


Fig. A 11 Backward trajectories on 14-09-2010, 09, 10 and 11 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

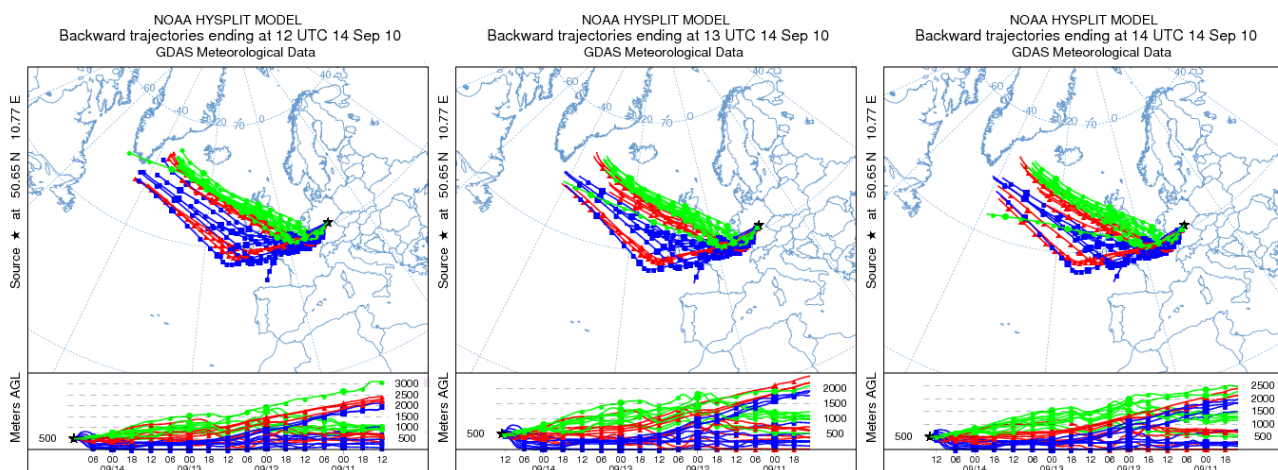


Fig. A 12 Backward trajectories on 14-09-2010, 12, 13 and 14 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

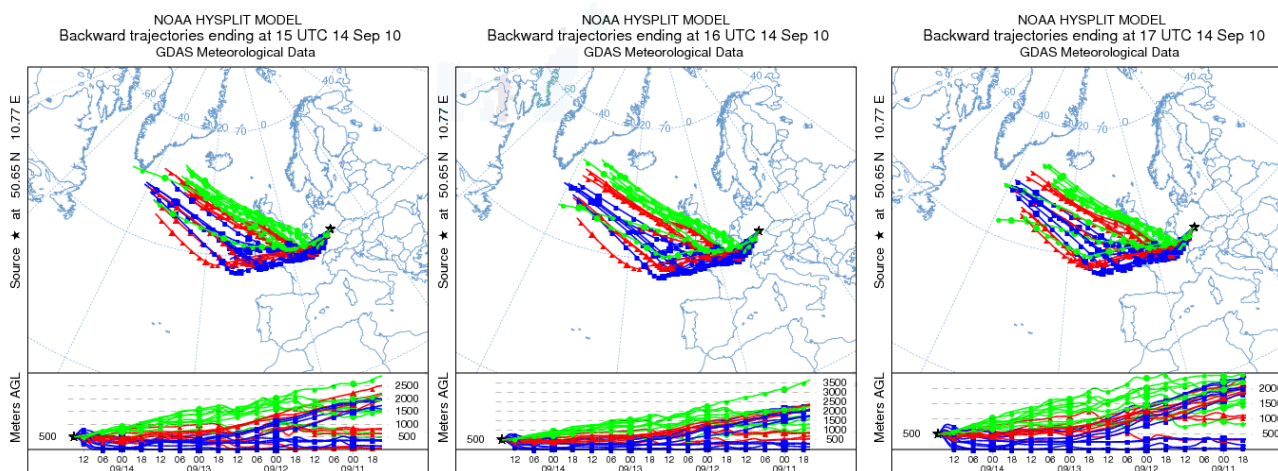
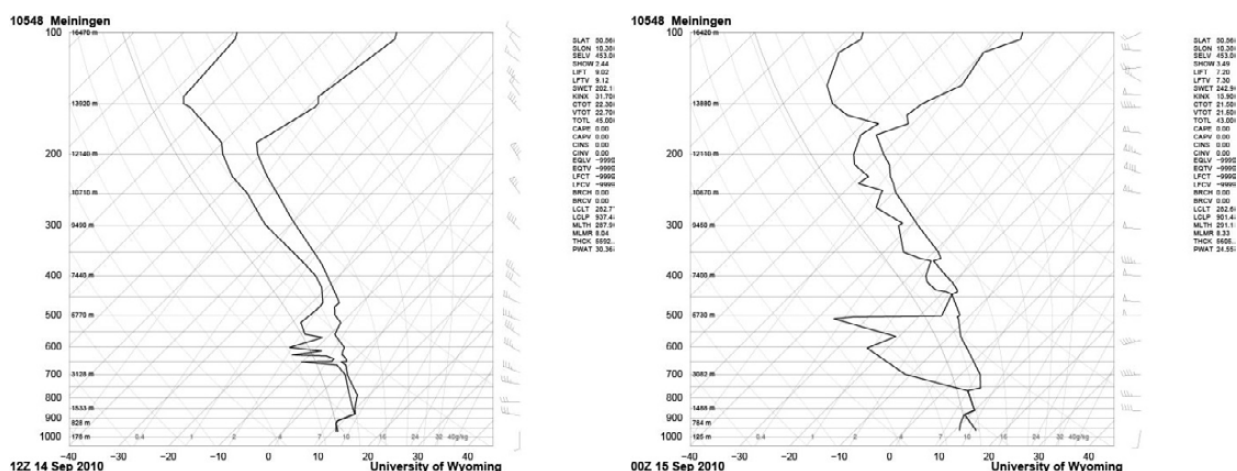


Fig. A 13 Backward trajectories on 14-09-2010, 15, 16 and 17 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

**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 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

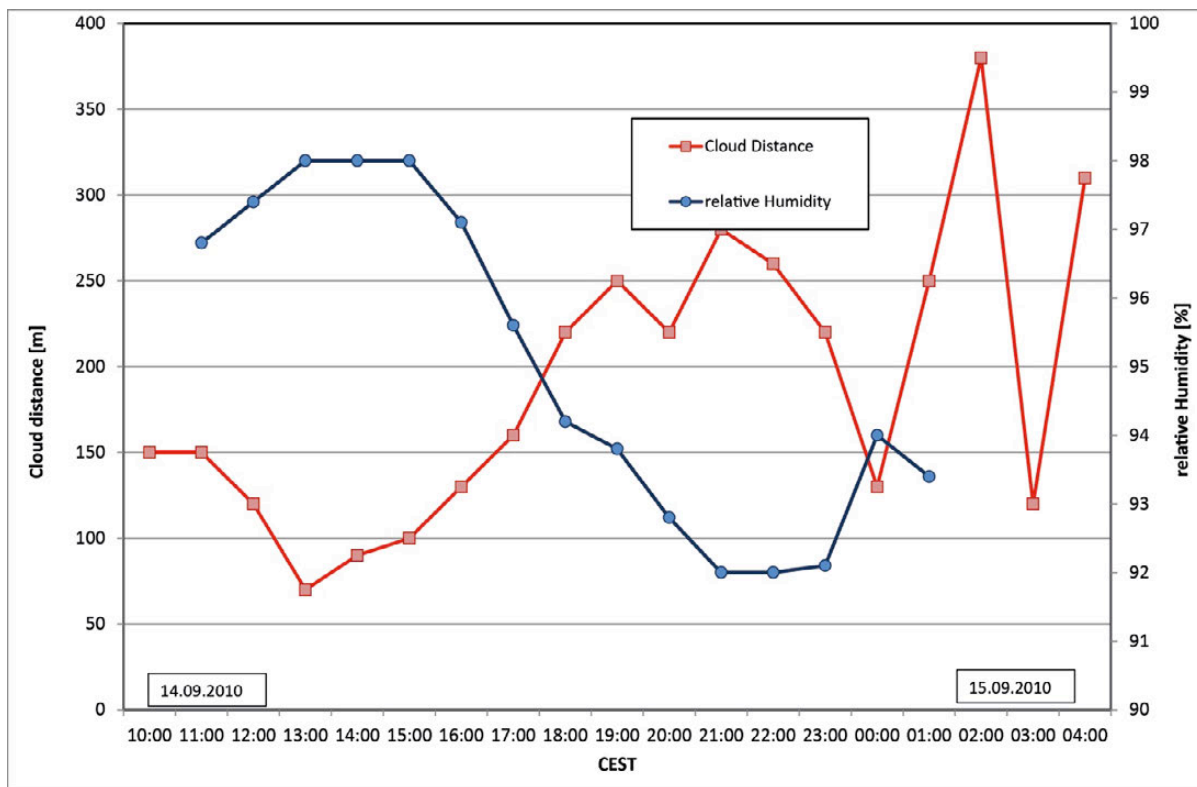


Fig. A 18 Cloud height and relative humidity on cloud event FCE1.1.

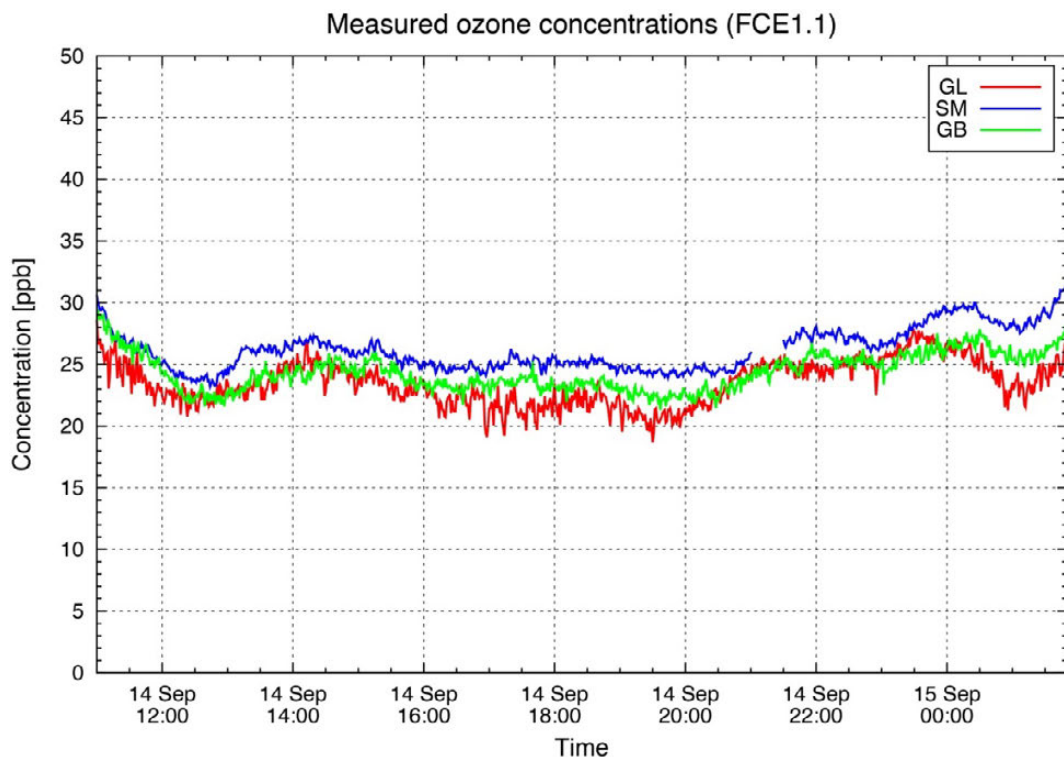


Fig. A 19 Measured ozone concentration over the full event.

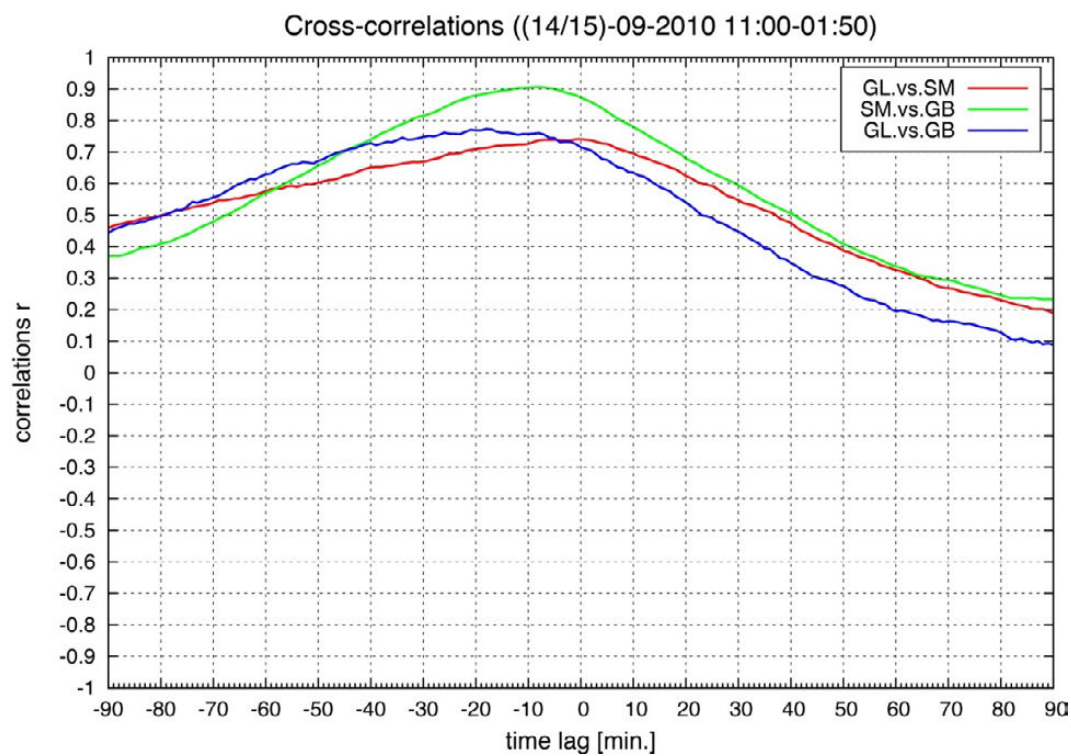


Fig. A 20 Cross-correlation of the full event.

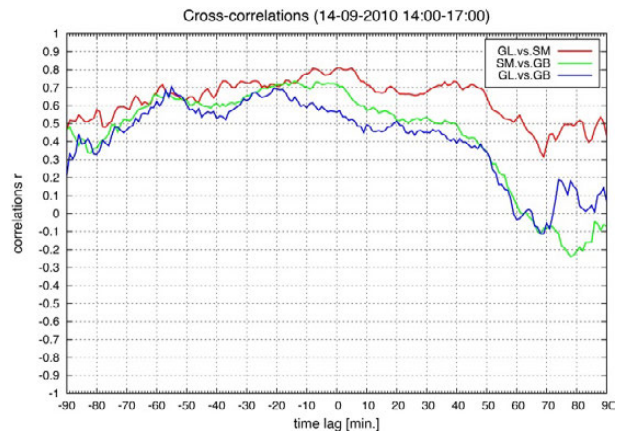
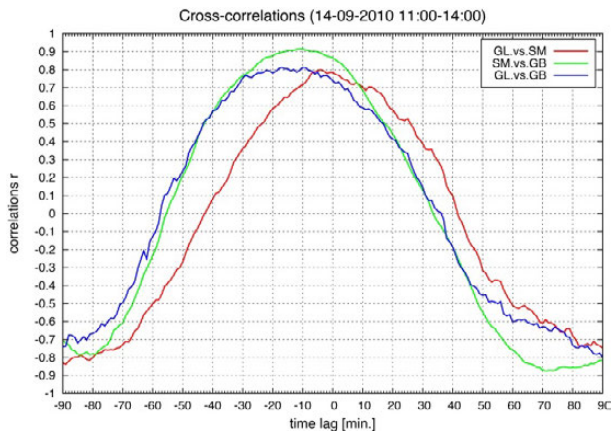


Fig. A 21 Cross-correlation on 14-09-2010, 11 - 14 CEST and 14 - 17 CEST.

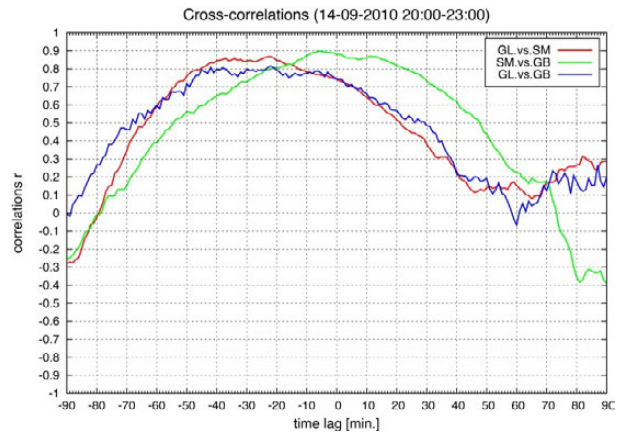
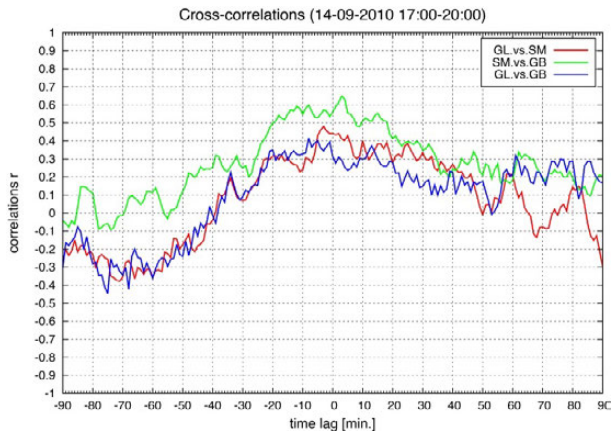


Fig. A 22 Cross-correlation on 14-09-2010, 17 - 20 CEST and 20 - 23 CEST.

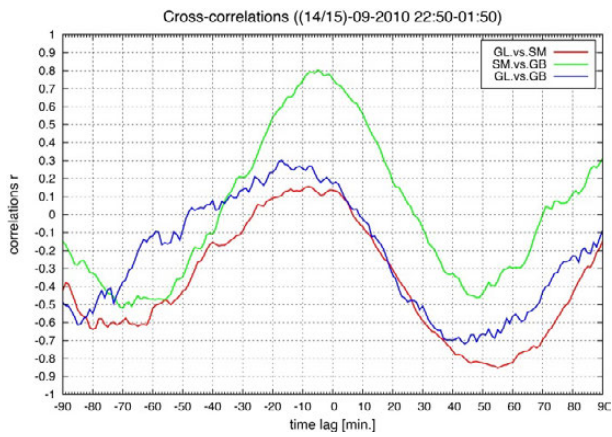


Fig. A 23 Cross-correlation on 14 and 15-09-2010, 22:50 - 01:50 CEST.

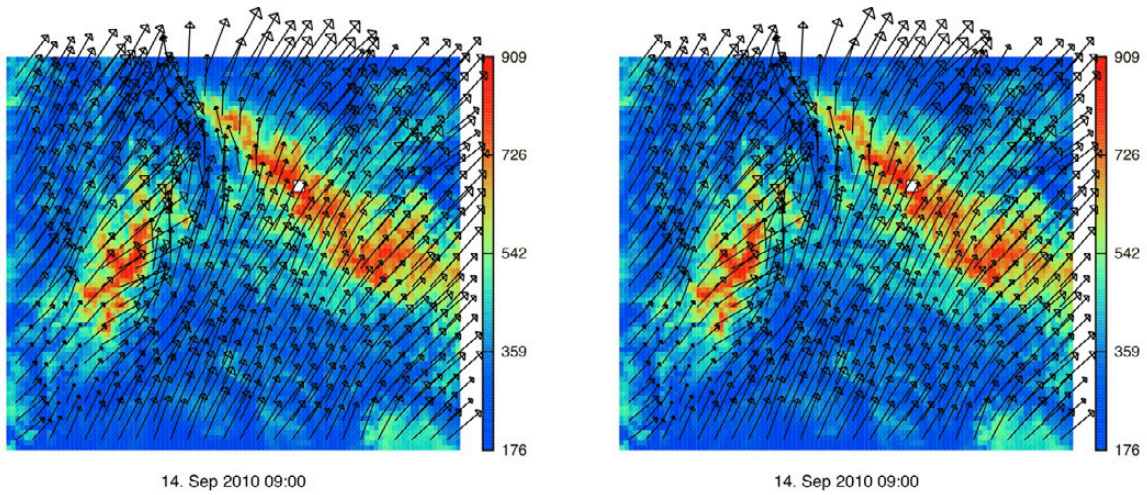


Fig. A 24 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

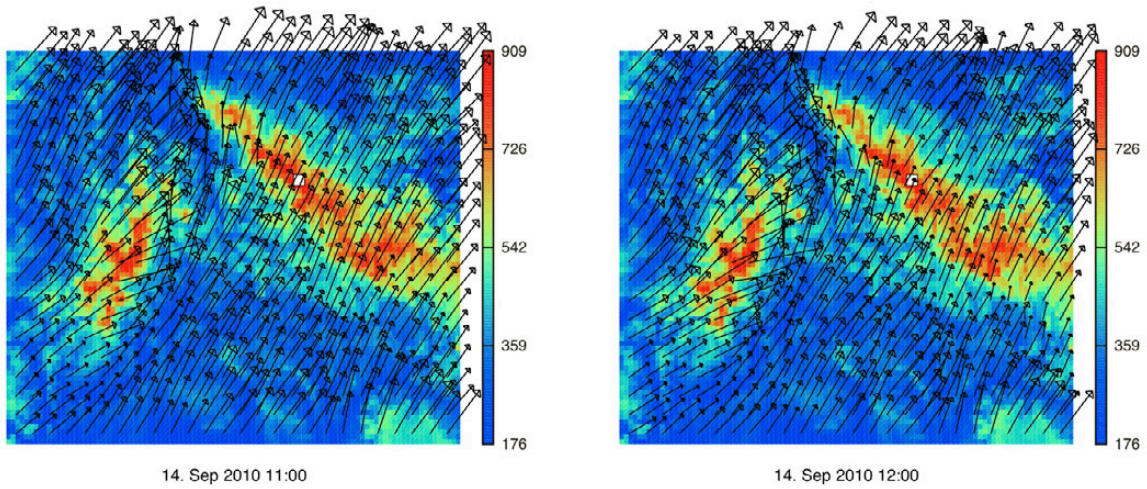


Fig. A 25 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

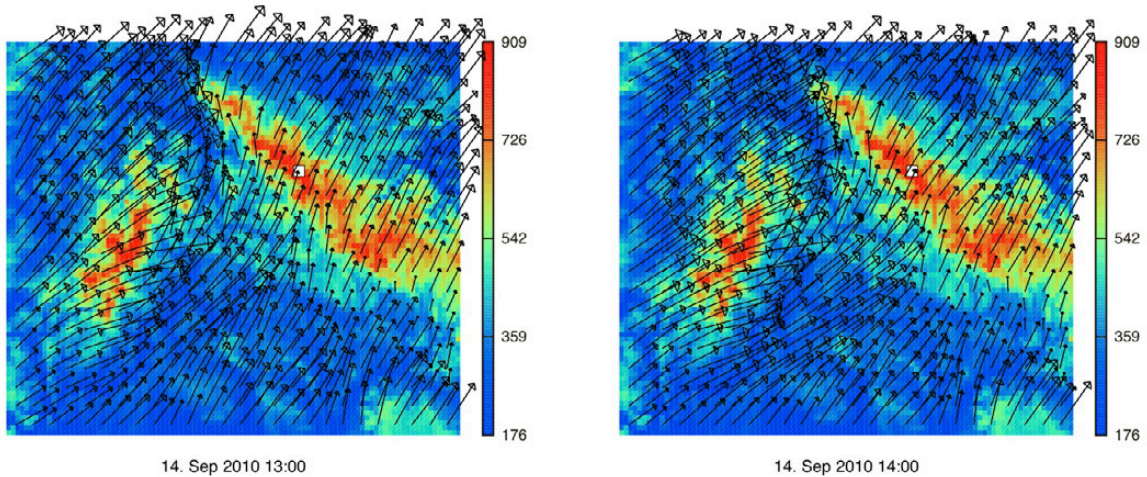


Fig. A 26 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

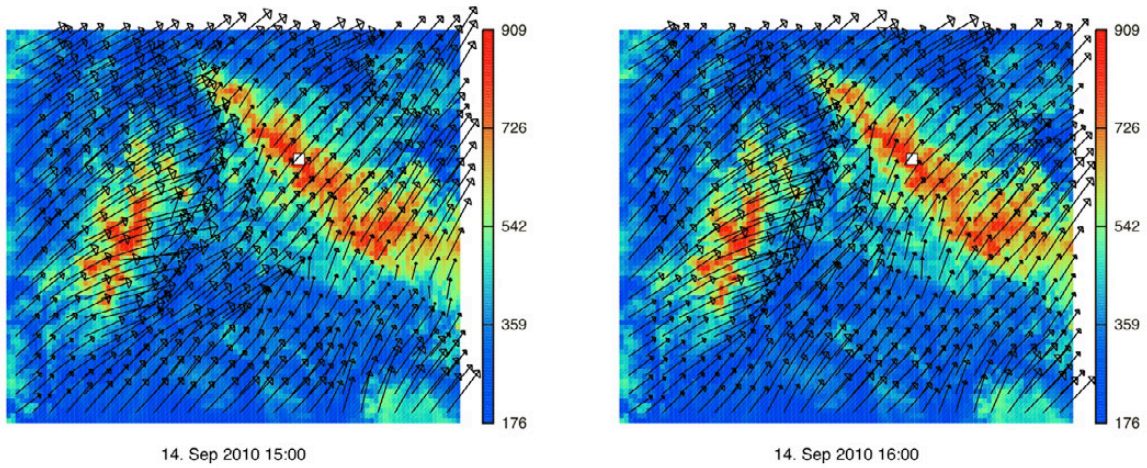


Fig. A 27 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

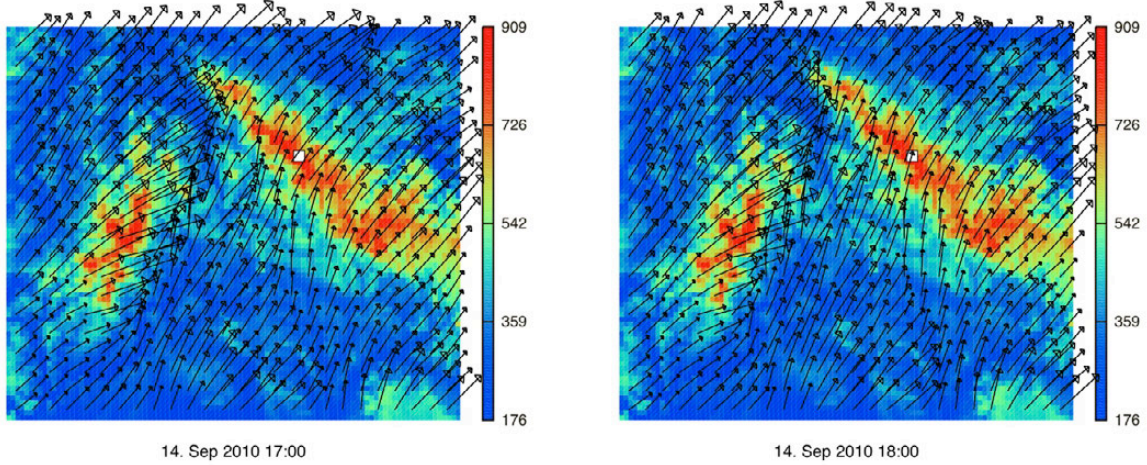


Fig. A 28 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

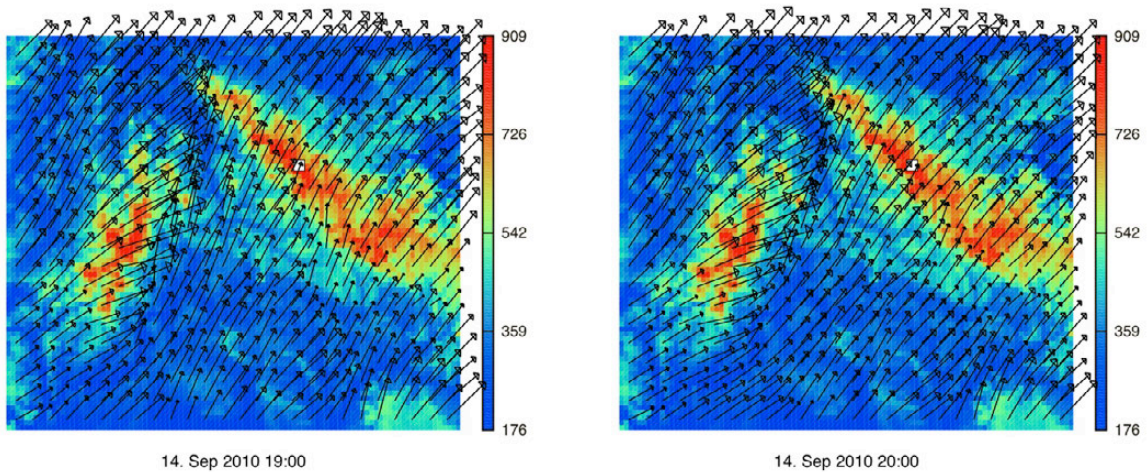


Fig. A 29 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

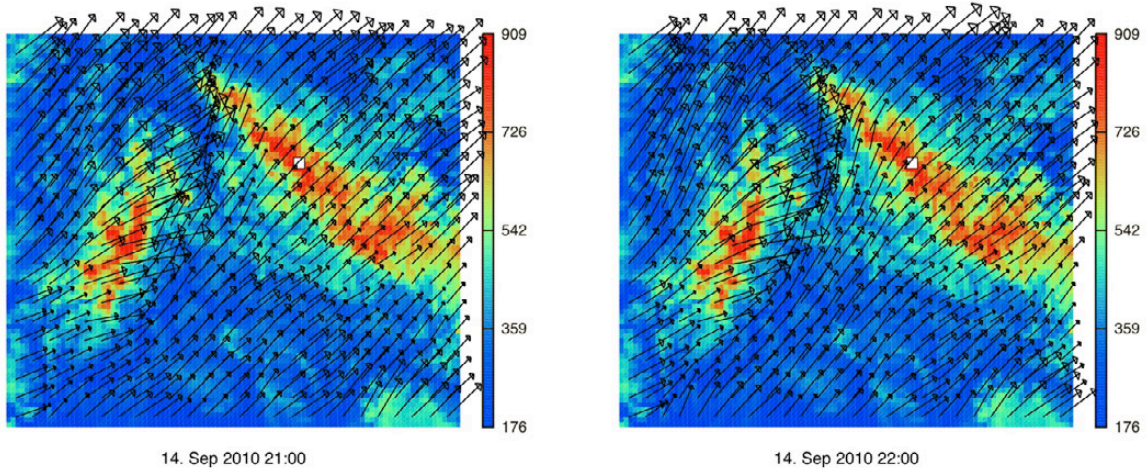


Fig. A 30 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

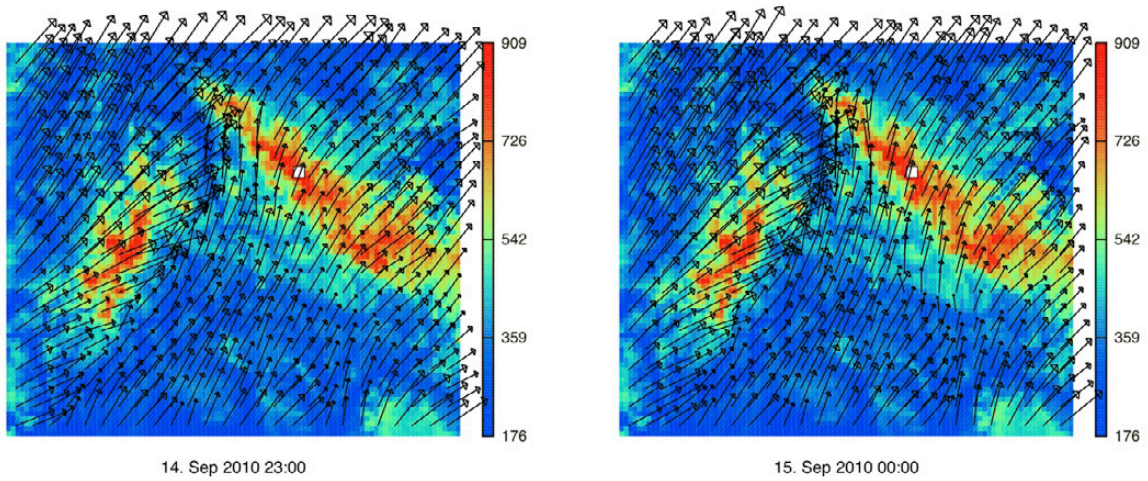


Fig. A 31 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

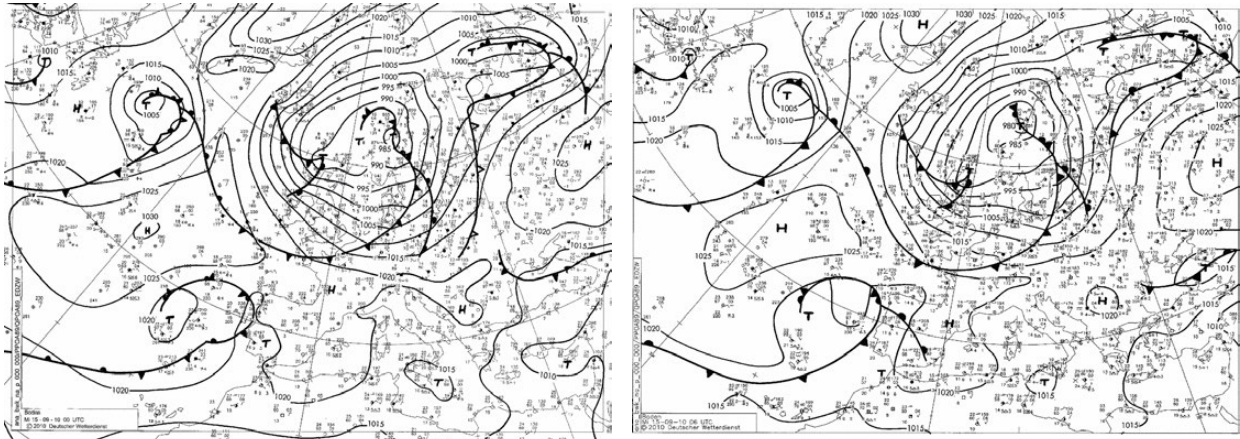


Fig. B 1 Surface weather charts on 15-09-2010, 00 UTC and 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

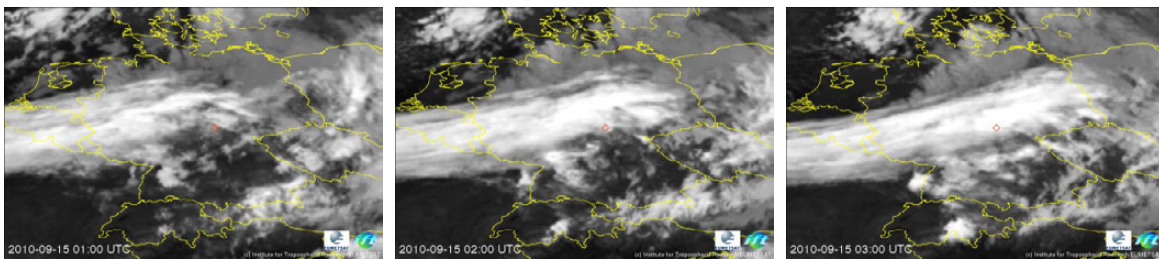


Fig. B 2 IR-satellite picture on 15-09-2010, 01, 02 and 03 UTC (source: ©TROPOS/EUMETSAT).

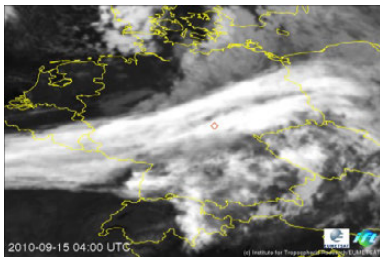


Fig. B 3 IR-satellite picture on 15-09-2010, 04 UTC (source: ©TROPOS/EUMETSAT).

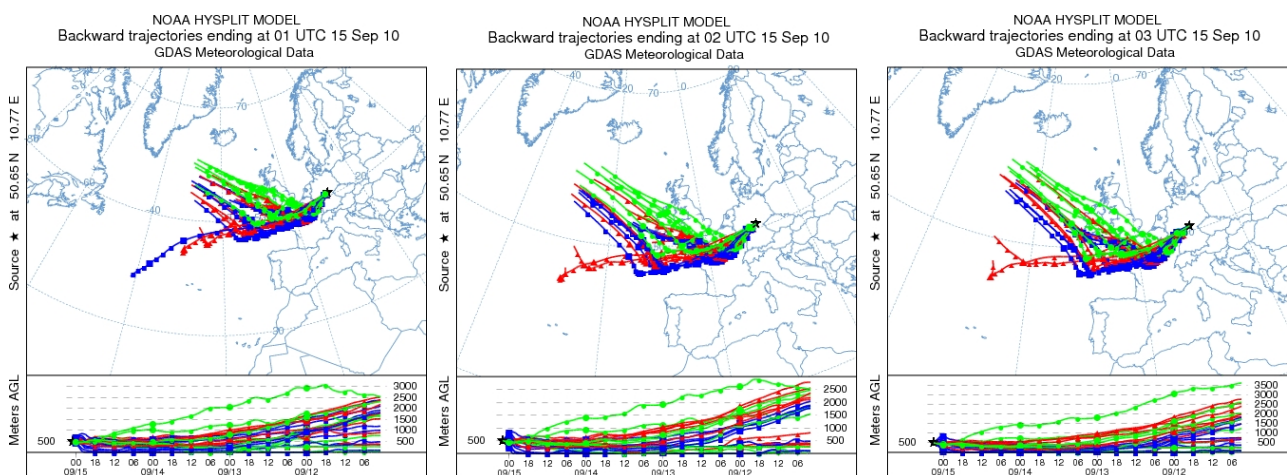


Fig. B 4 Backward trajectories on 15-09-2010, 01, 02 and 03 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

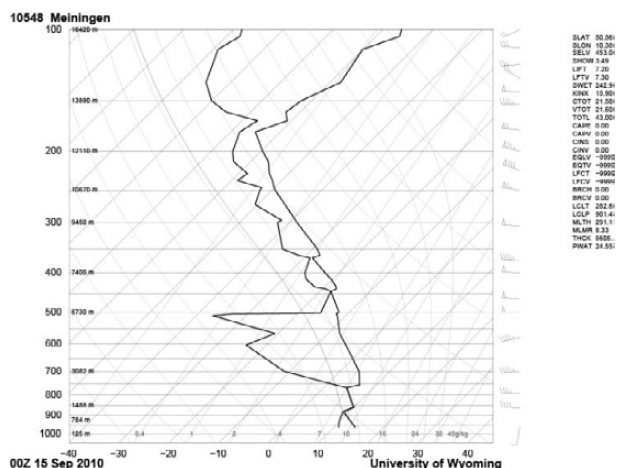


Fig. B 5 Vertical rawinsonde profiles of temperature and dew-point temperature on 15-09-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

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 [°]
15-09-2010 03:00	9.2	902.3	0.0	7.6	
15-09-2010 03:10	9.2	902.3	0.0	8.7	235.0
15-09-2010 03:20	9.2	901.9	0.0	8.9	226.4
15-09-2010 03:30	9.2	901.8	0.2	8.8	230.6
15-09-2010 03:40	9.2	901.7	0.0	8.3	229.1
15-09-2010 03:50	9.2	901.4	0.2	8.8	217.4
15-09-2010 04:00	9.2	901.3	0.0	9.3	231.7
15-09-2010 04:10	9.1	901.2	0.0	9.4	231.0
15-09-2010 04:20	9.1	901.1	0.0	9.5	232.8
15-09-2010 04:30	9.1	900.9	0.0	9.3	230.6
15-09-2010 04:40	9.1	900.7	0.0	9.5	238.9
15-09-2010 04:50	9.2	900.6	0.0	9.6	230.7
15-09-2010 05:00	9.2	900.4	0.0	9.9	230.5
15-09-2010 05:10	9.2	900.2	0.0	10.0	237.7
15-09-2010 05:20	9.2	899.8	0.0	9.9	236.5
15-09-2010 05:30	9.2	899.7	0.0	10.4	240.5
15-09-2010 05:40	9.2	899.7	0.0	9.8	236.6
15-09-2010 05:50	9.2	899.3	0.0	10.7	220.5
15-09-2010 06:00	9.2	899.2	0.0	10.9	223.6
15-09-2010 06:10	9.2	899.2	0.0	10.6	234.4
15-09-2010 06:20	9.2	899.3	0.0	10.9	232.3

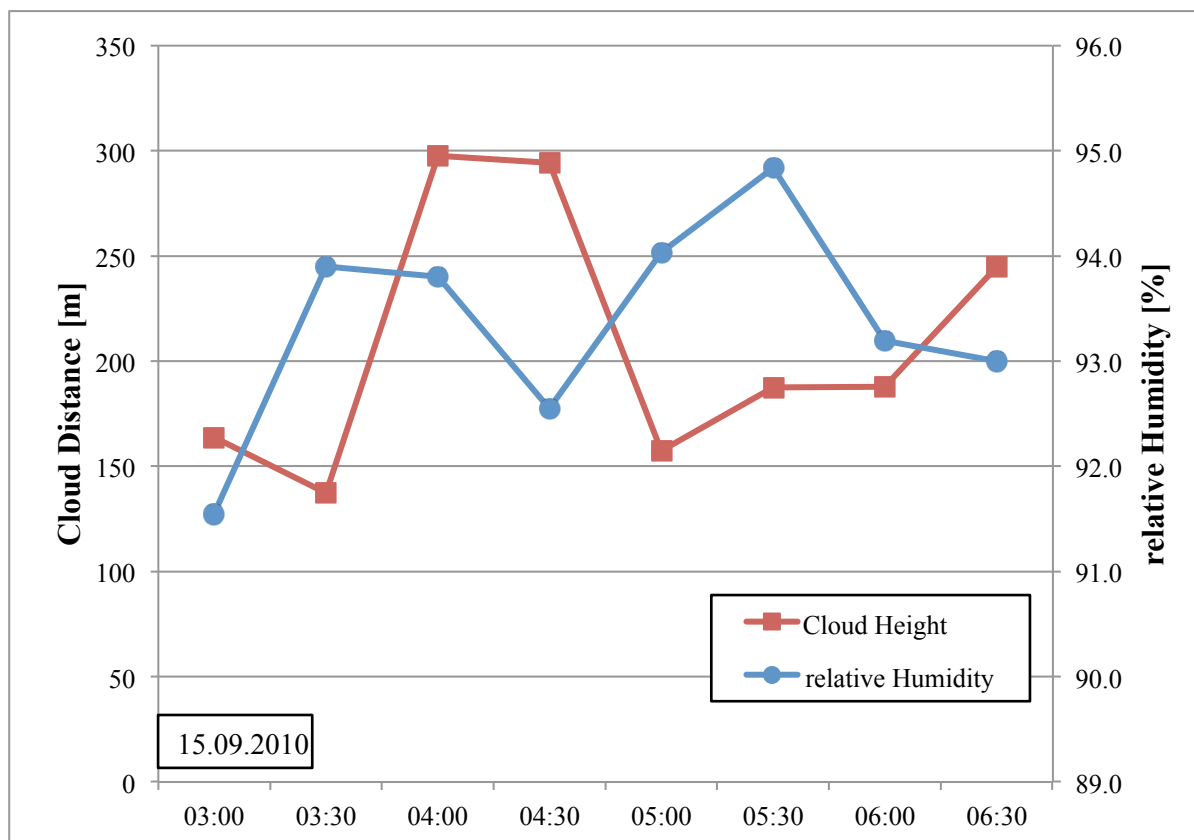


Fig. B 6 Cloud height and relative humidity on cloud event FCE1.2.

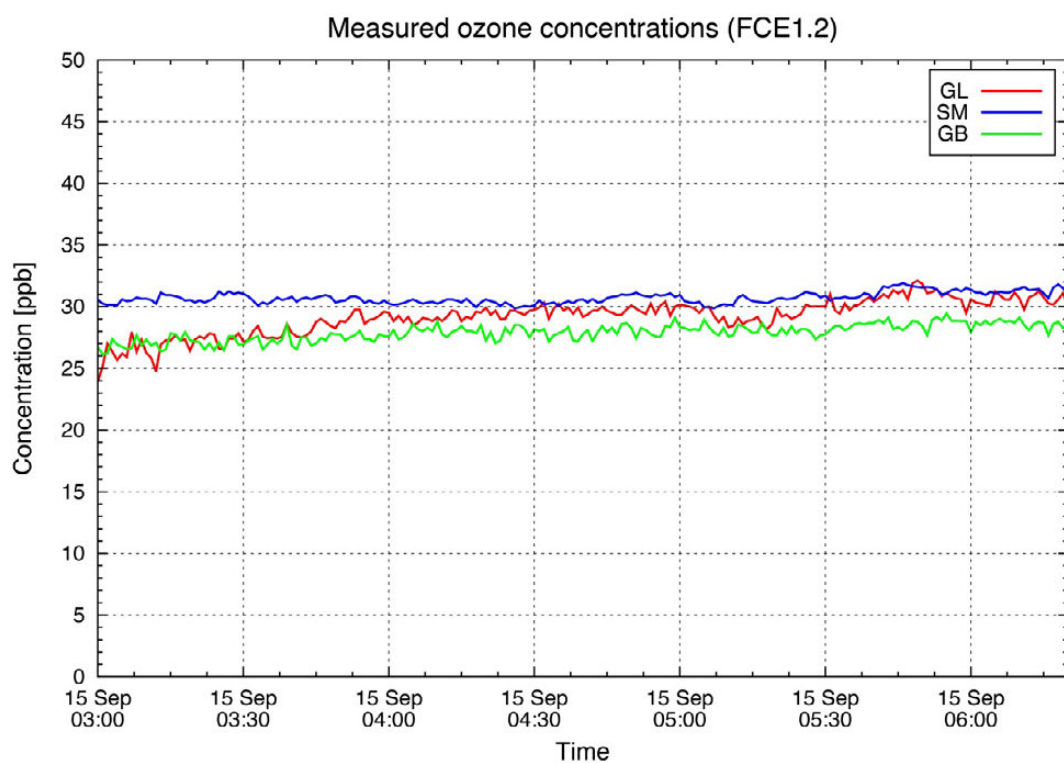


Fig. B 7 Measured ozone concentration over the full event.

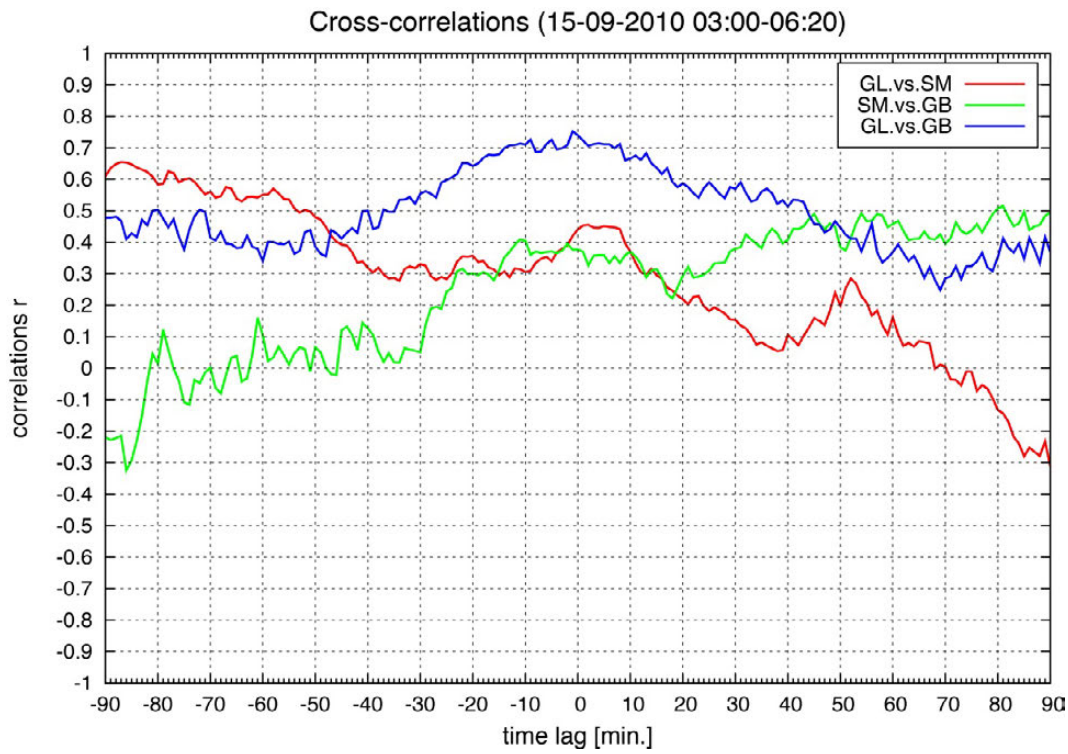


Fig. B 8 Cross-correlation of the full event.

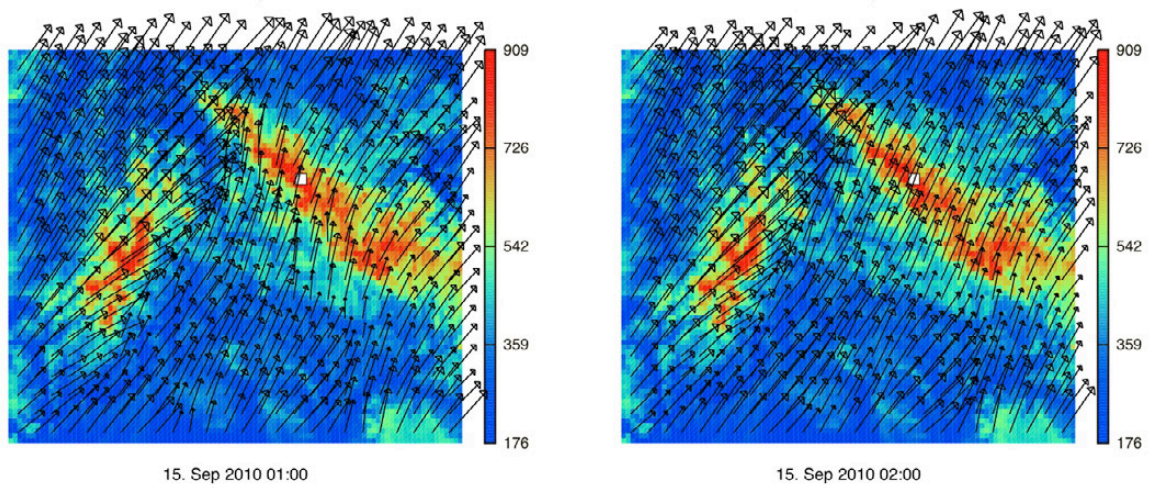


Fig. B 9 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

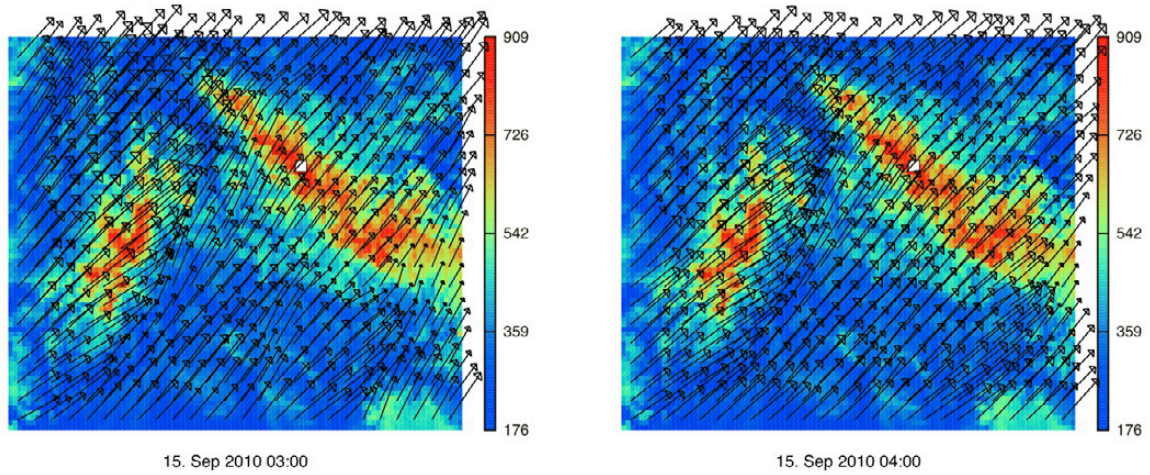


Fig. B 10 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

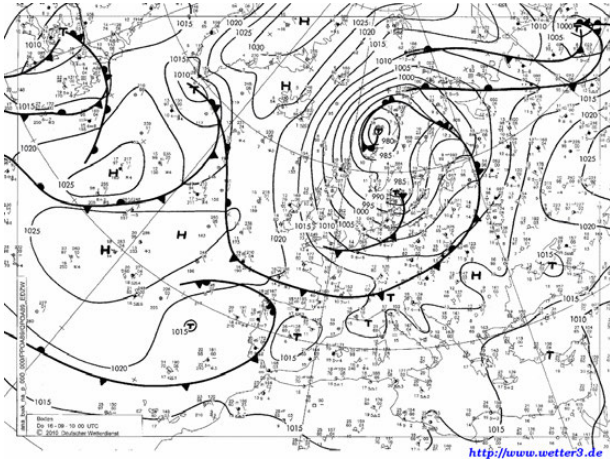


Fig. C 1 Surface weather charts on 16-09-2010, 00 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

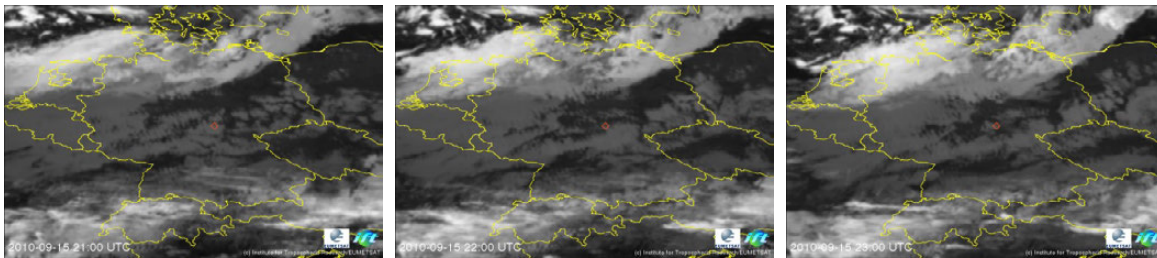


Fig. C 2 IR-satellite picture on 15-09-2010, 21, 22 and 23 UTC (source: ©TROPOS/EUMETSAT).

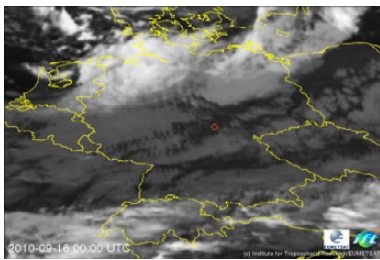


Fig. C 3 IR-satellite picture on 16-09-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

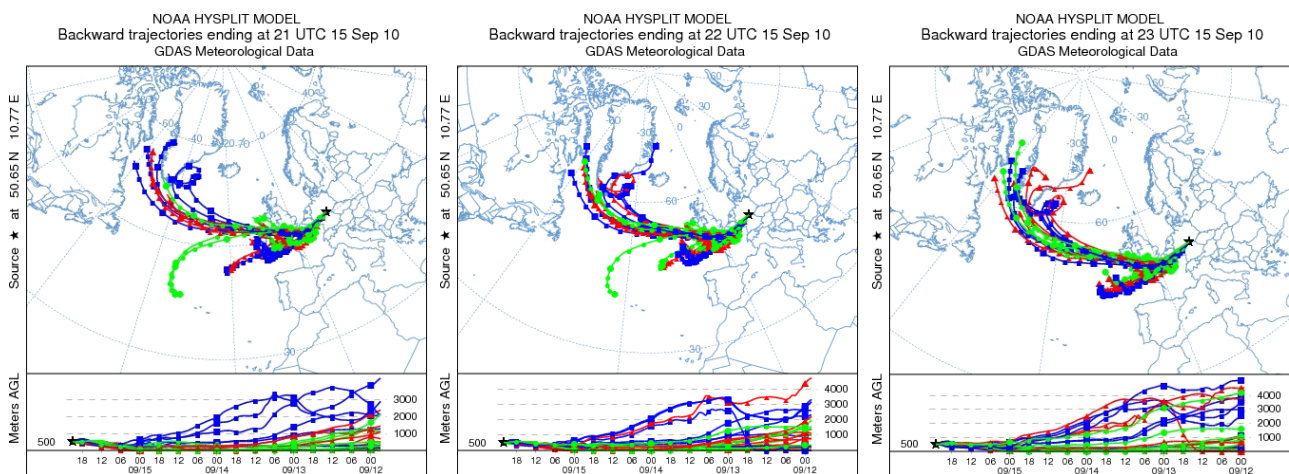


Fig. C 4 Backward trajectories on 15-09-2010, 21, 22 and 23 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

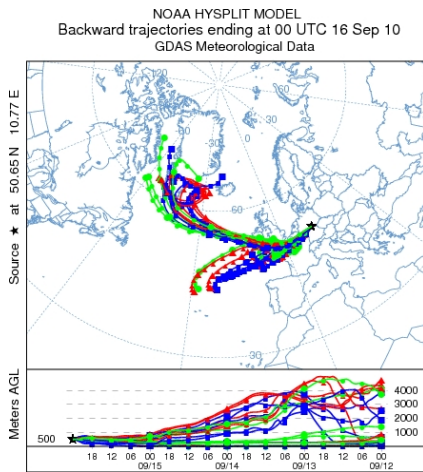


Fig. C 5 Backward trajectories on 16-09-2010, 00 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

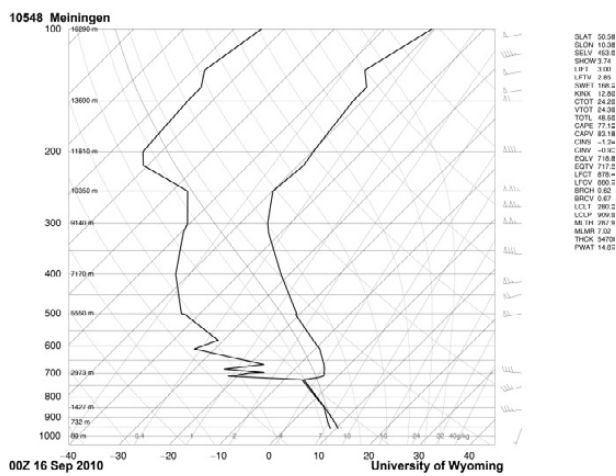


Fig. C 6 Vertical rawinsonde profiles of temperature and dew-point temperature on 16-09-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

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 [°]
15-09-2010 23:00	6.7	898.2	0.0	6.7	247.8
15-09-2010 23:10	6.7	898.2	0.0	7.3	238.9
15-09-2010 23:20	6.8	898.1	0.0	7.7	236.0
15-09-2010 23:30	6.8	898.1	0.0	8.1	234.5
15-09-2010 23:40	6.8	898.1	0.0	7.9	238.3
15-09-2010 23:50	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

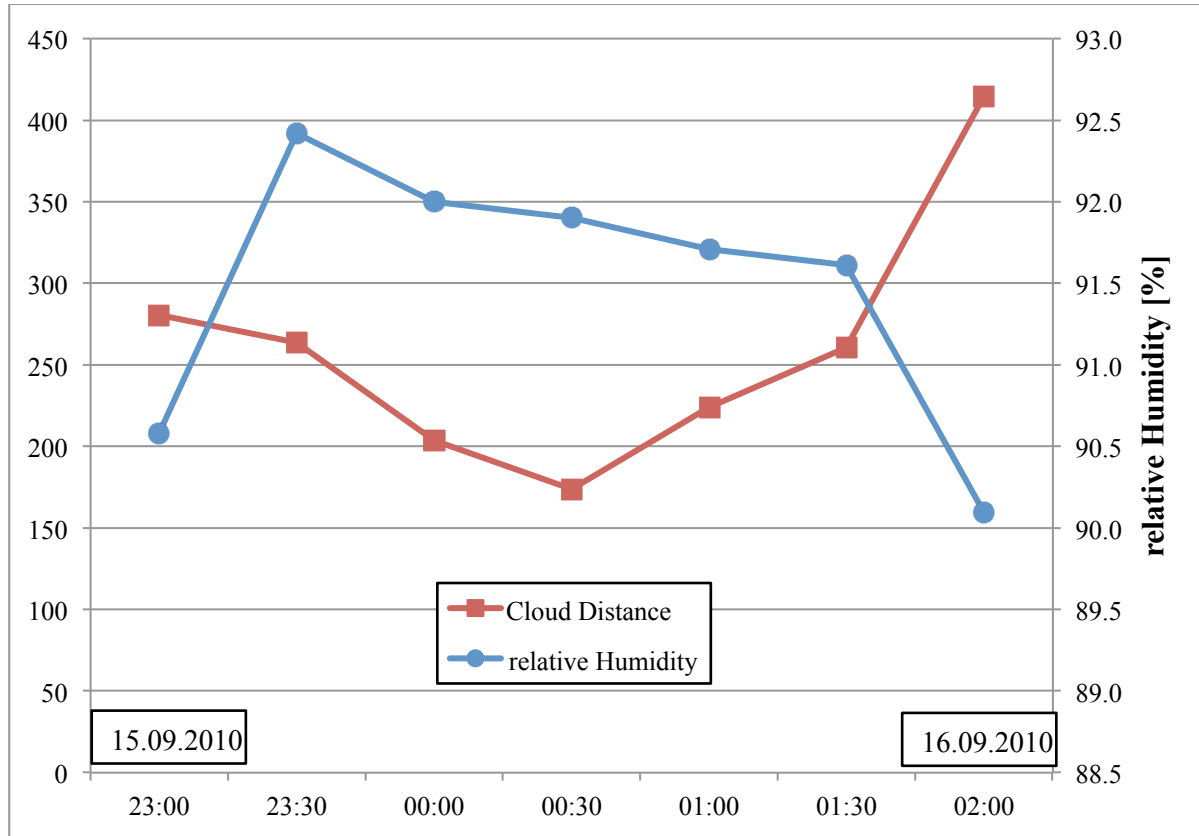


Fig. C 7 Cloud height and relative humidity on cloud event FCE2.1.

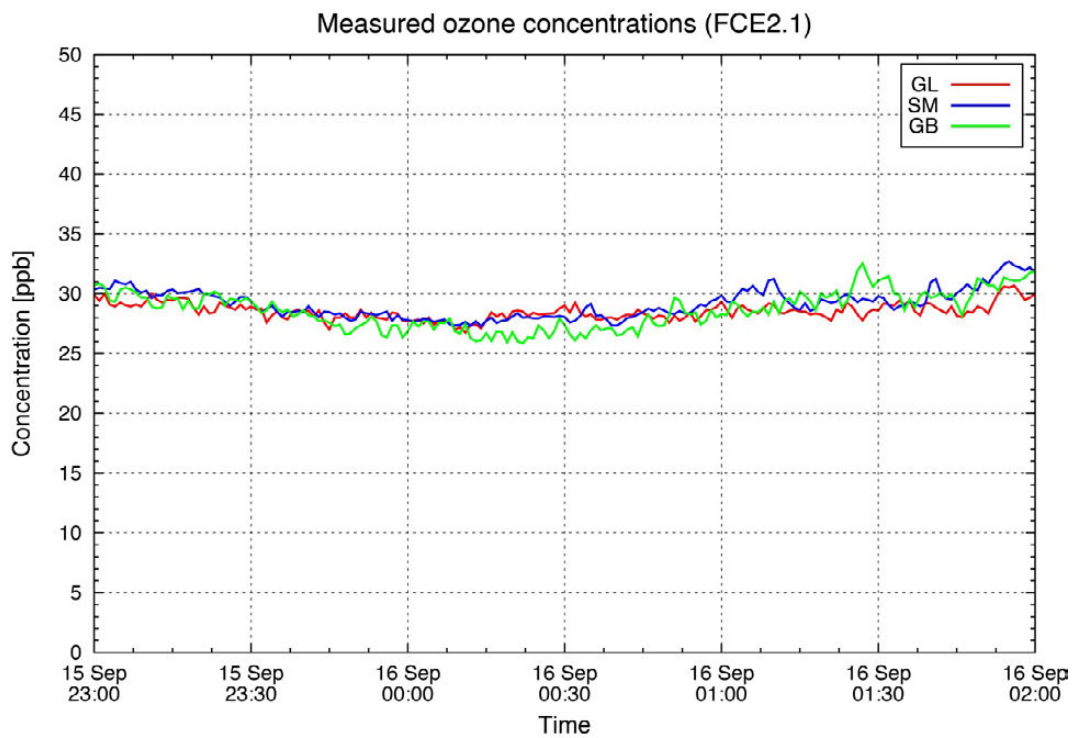


Fig. C 8 Measured ozone concentration over the full event.

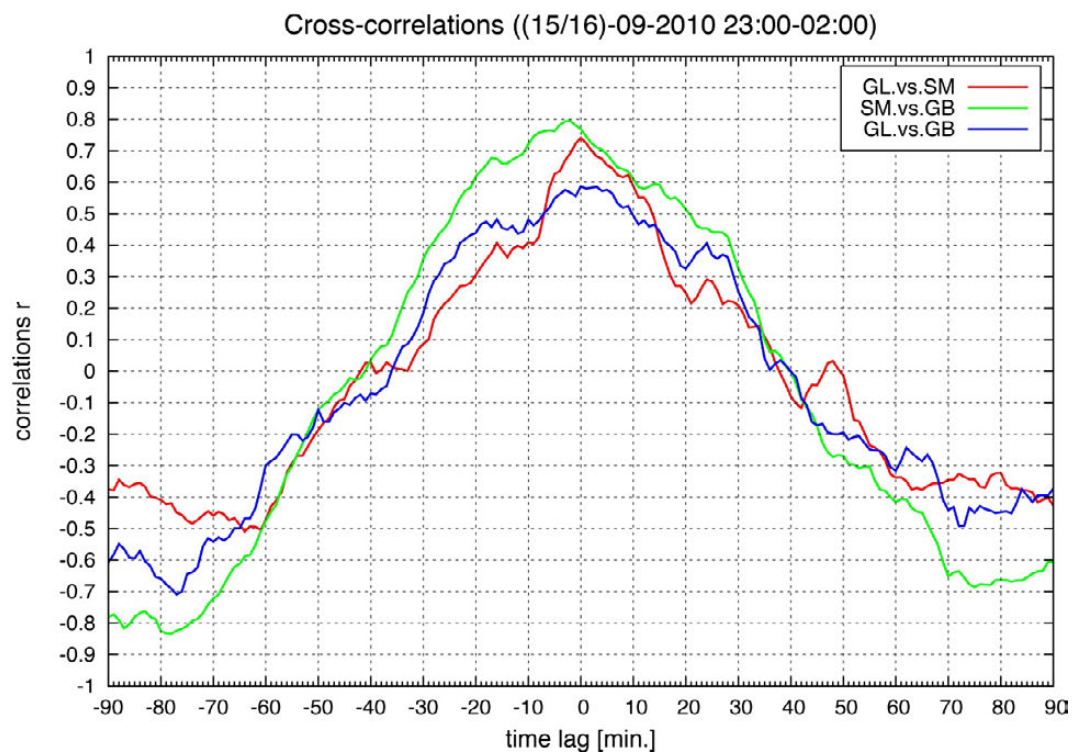


Fig. C 9 Cross-correlation of the full event.

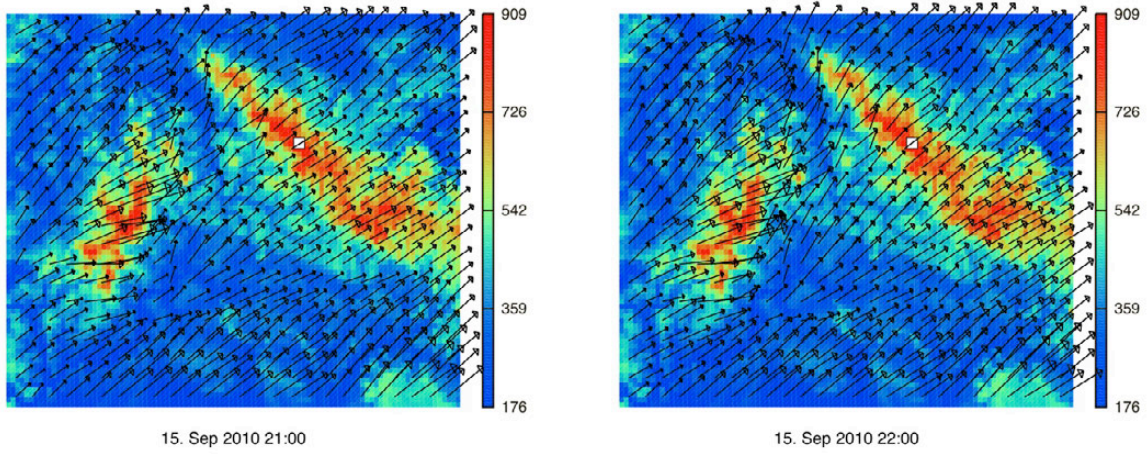


Fig. C 10 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

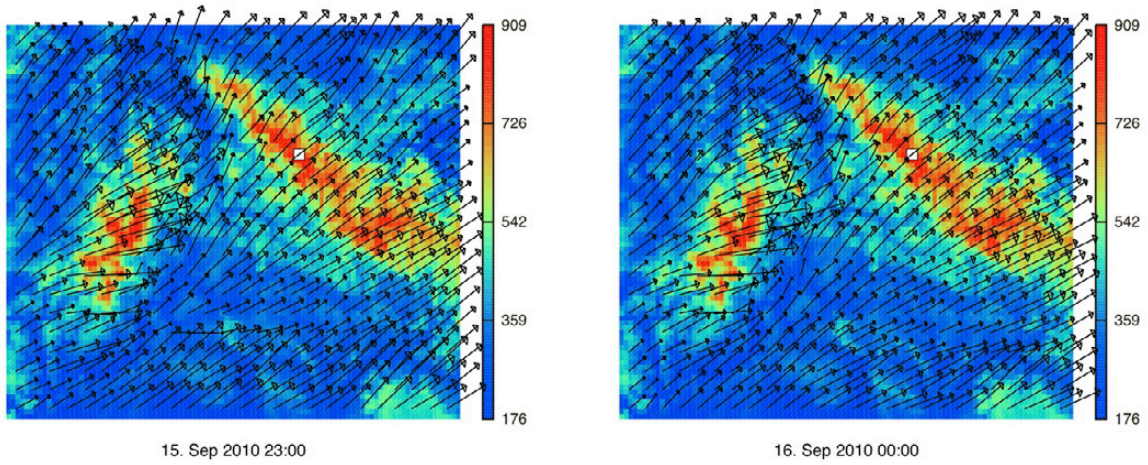


Fig. C 11 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

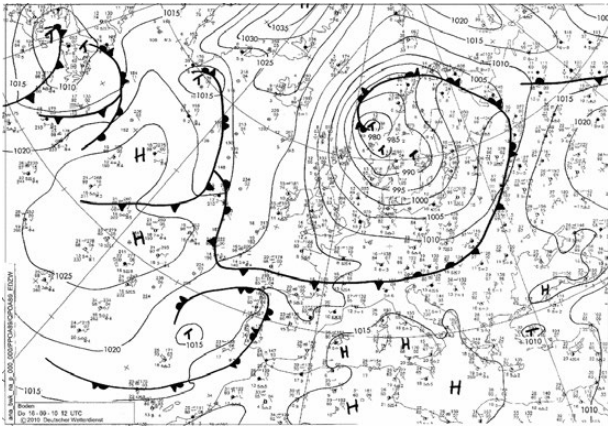


Fig. D 1 Surface weather charts on 16-09-2010, 12 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

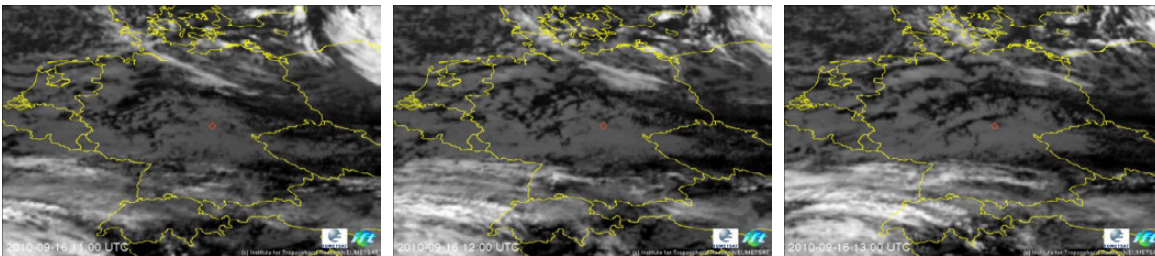


Fig. D 2 IR-satellite picture on 16-09-2010, 11, 12 and 13 UTC (source: ©TROPOS/EUMETSAT).

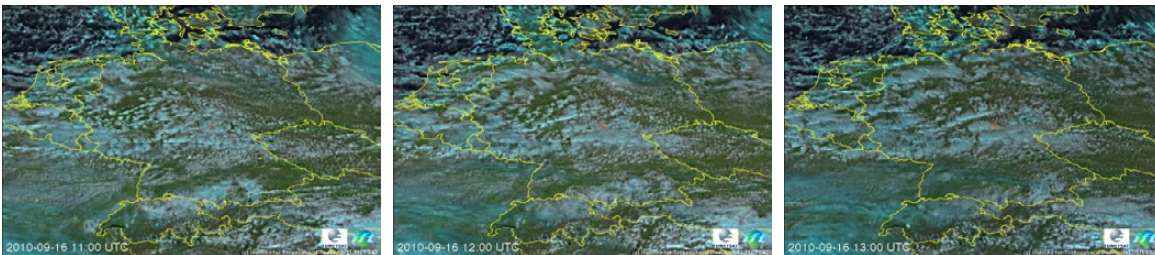


Fig. D 3 VIS-satellite picture on 16-09-2010, 11, 12 and 13 UTC (source: ©TROPOS/EUMETSAT).

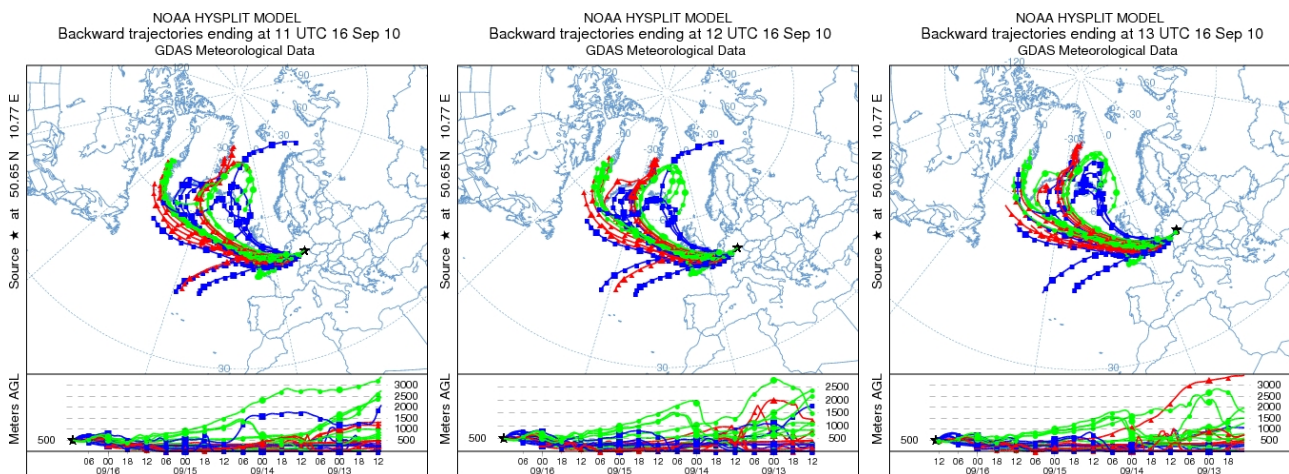


Fig. D 4 Backward trajectories on 16-09-2010, 11, 12 and 13 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

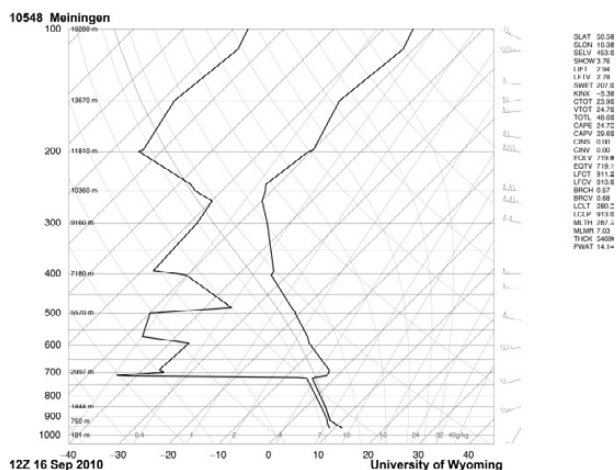


Fig. D 5 Vertical rawinsonde profiles of temperature and dew-point temperature on 16-09-2010, 12 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

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

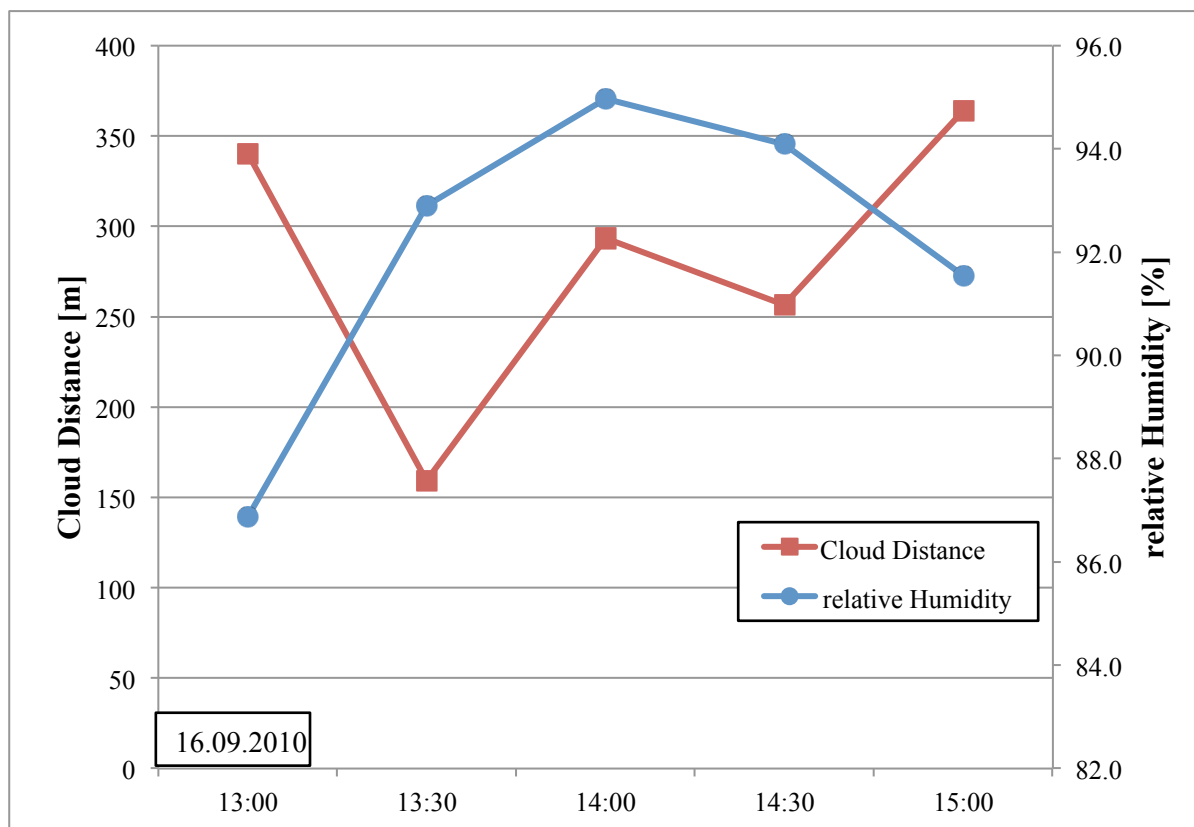


Fig. D 6 Cloud height and relative humidity on cloud event FCE4.1.

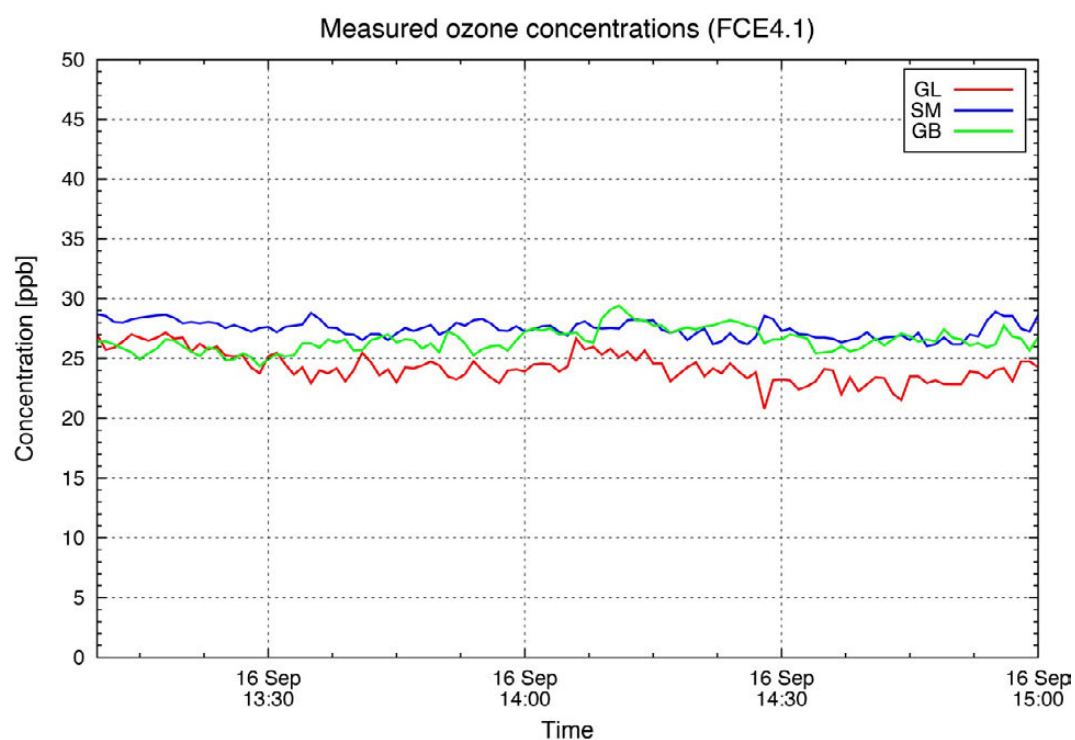


Fig. D 7 Measured ozone concentration over the full event.

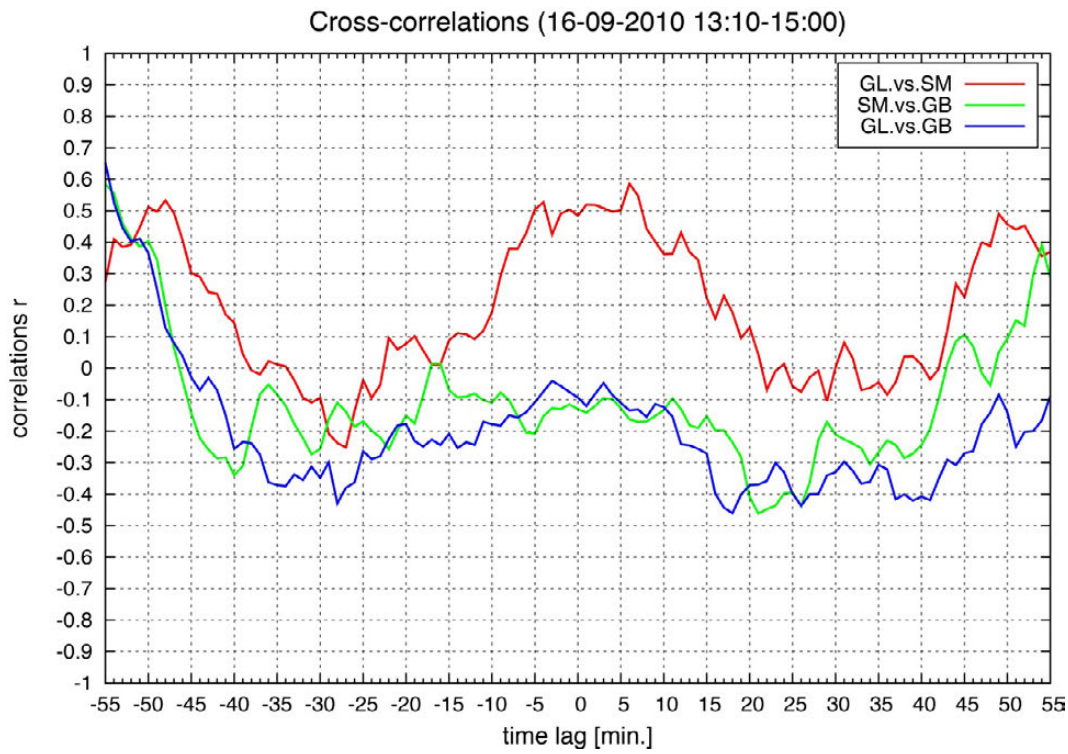


Fig. D 8 Cross-correlation of the full event.

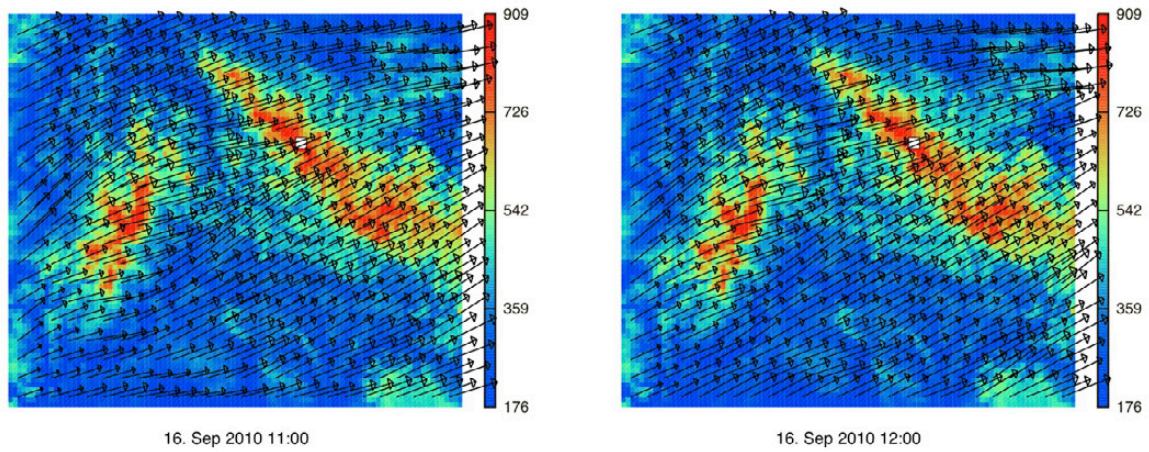


Fig. D 9 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

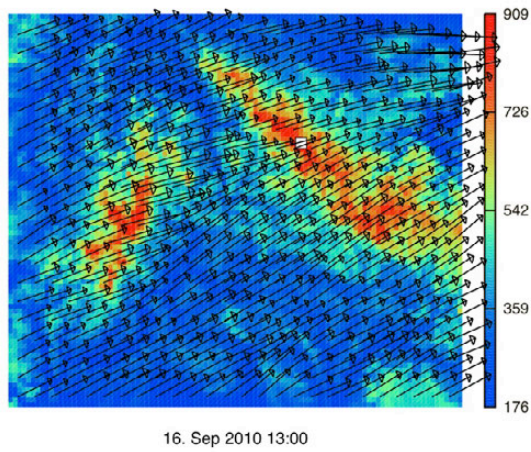
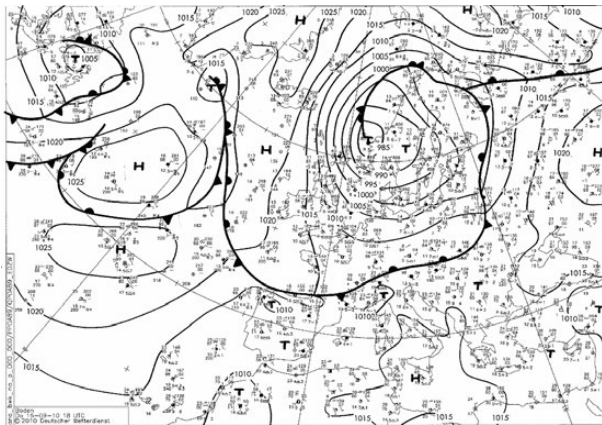


Fig. D 10 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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)).

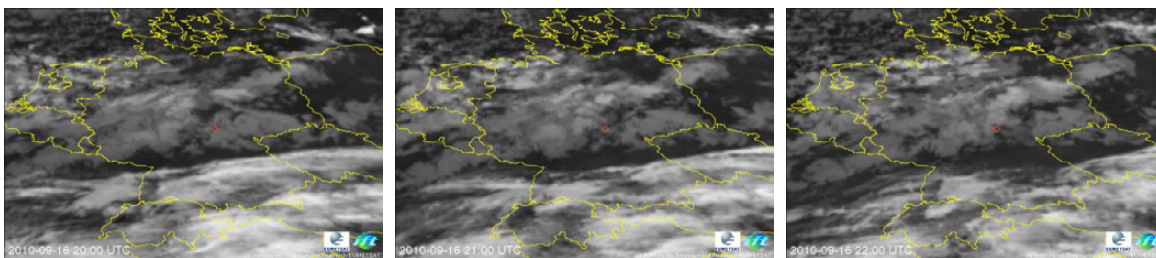


Fig. E 2 IR-satellite picture on 16-09-2010, 20, 21 and 22 UTC (source: ©TROPOS/EUMETSAT).

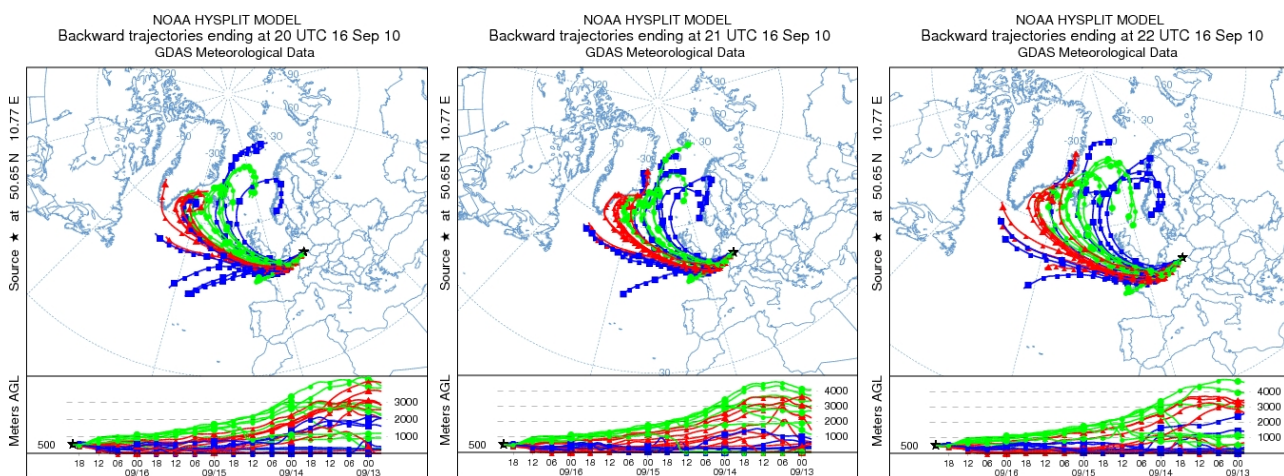


Fig. E 3 Backward trajectories on 16-09-2010, 20, 21 and 22 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

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

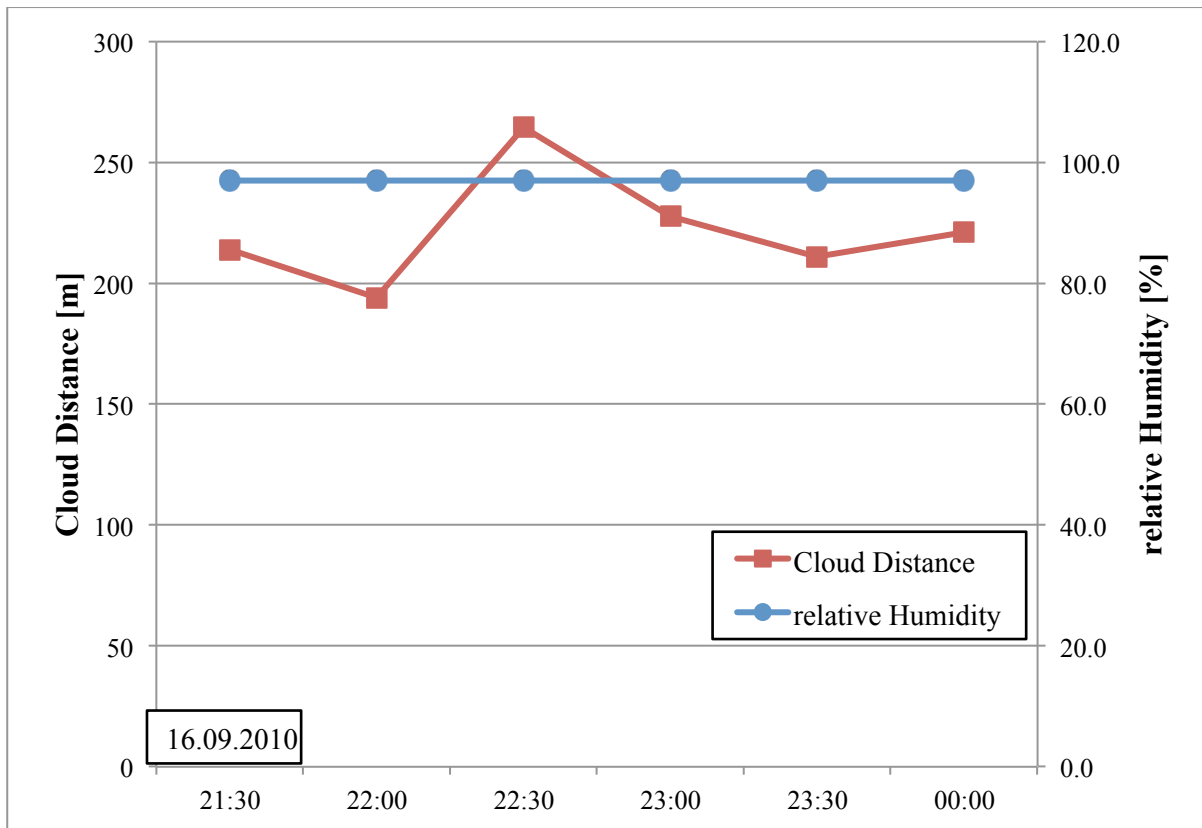


Fig. E 4 Cloud height and relative humidity on cloud event FCE5.1.

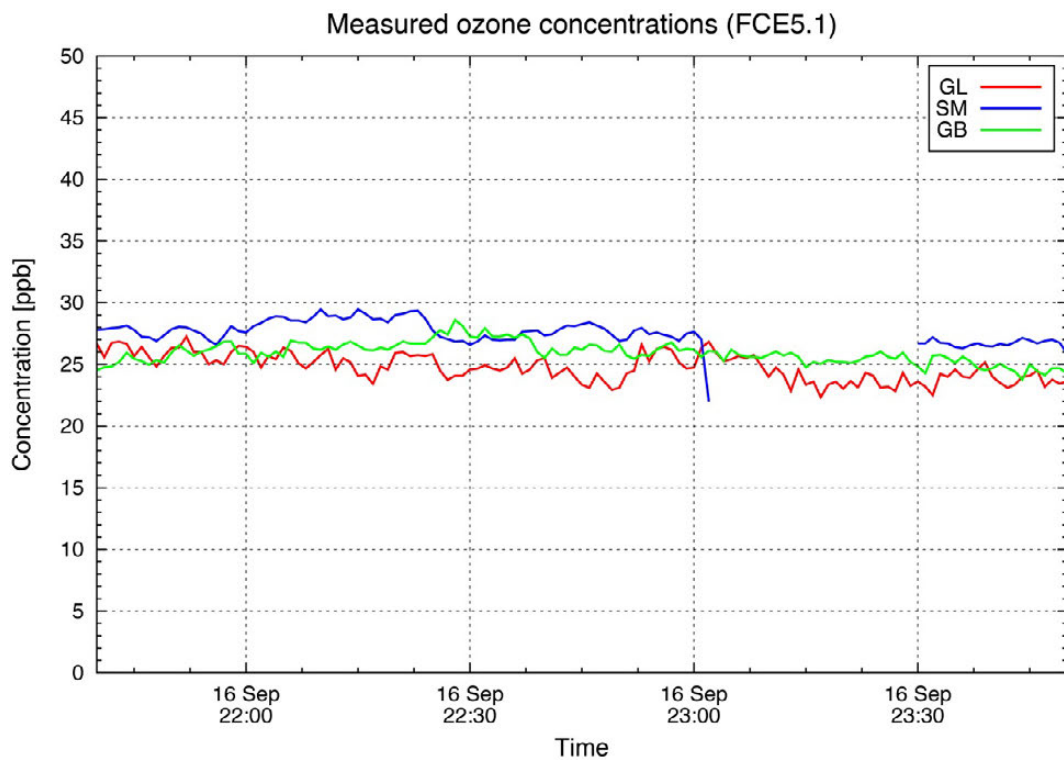


Fig. E 5 Measured ozone concentration over the full event.

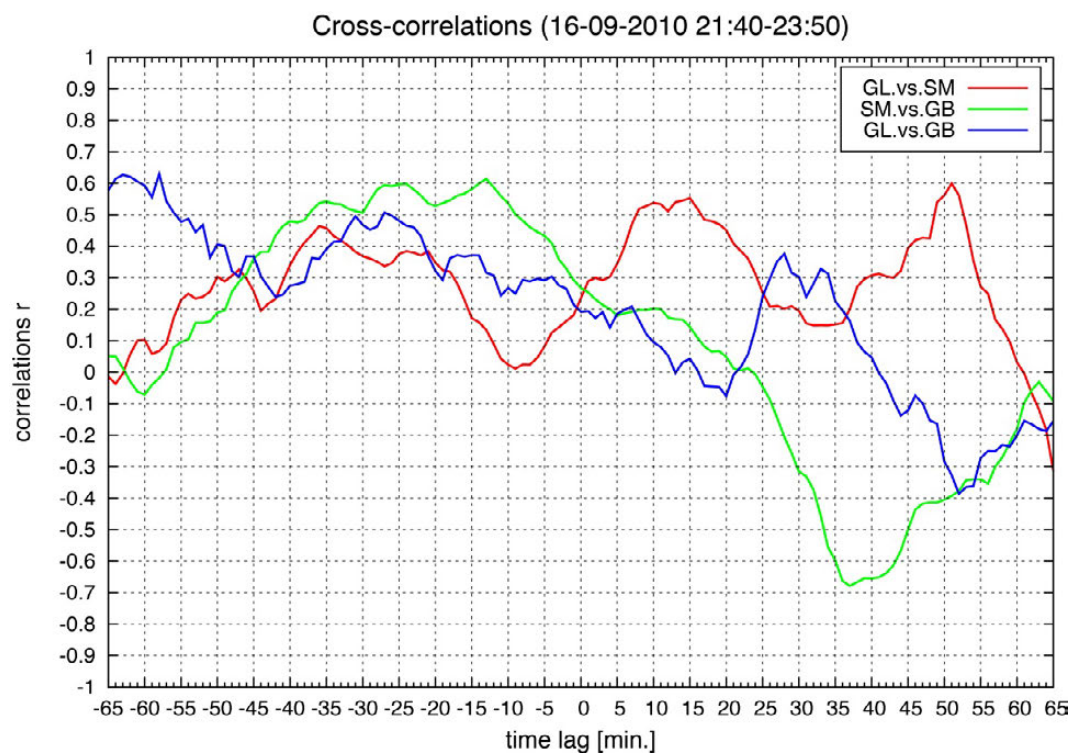


Fig. E 6 Cross-correlation of the full event.

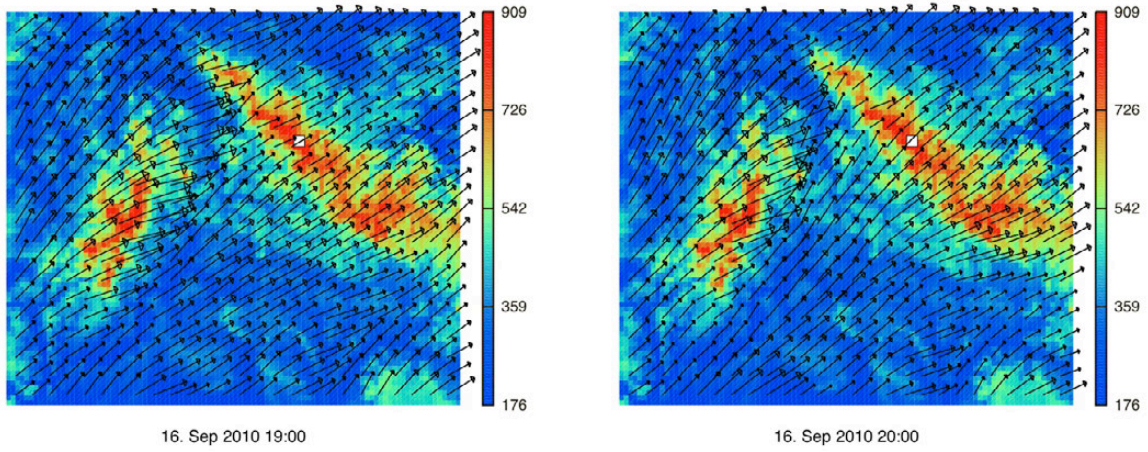


Fig. E 7 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

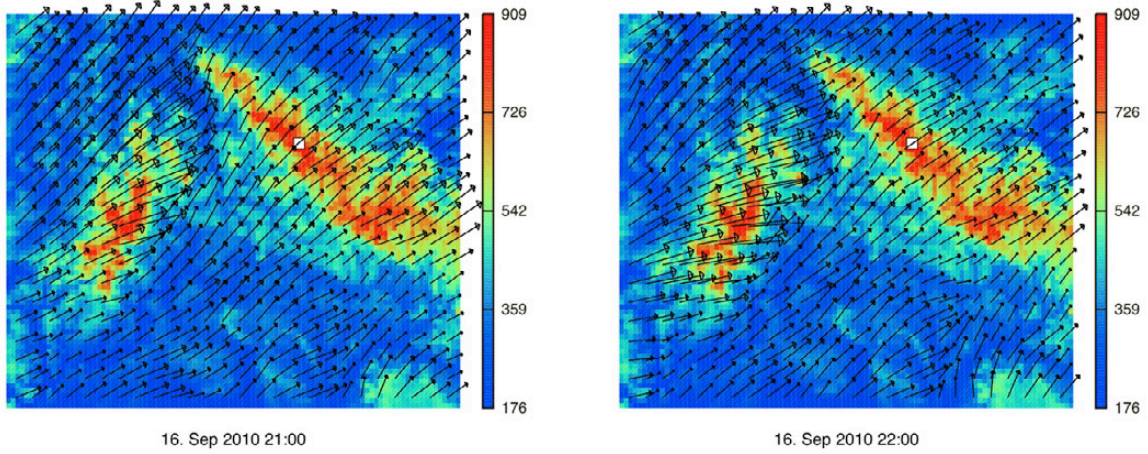


Fig. E 8 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

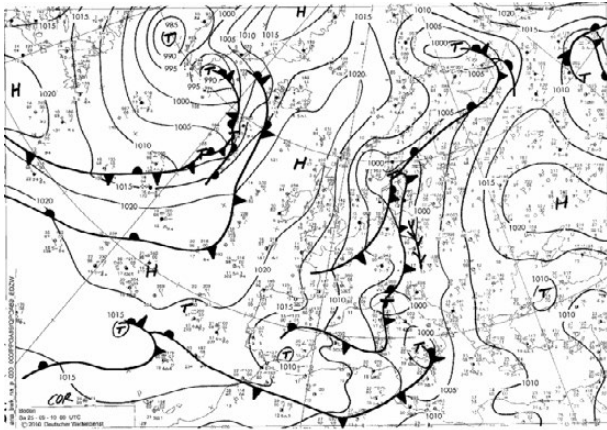


Fig. F 1 Surface weather charts on 25-09-2010, 00 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

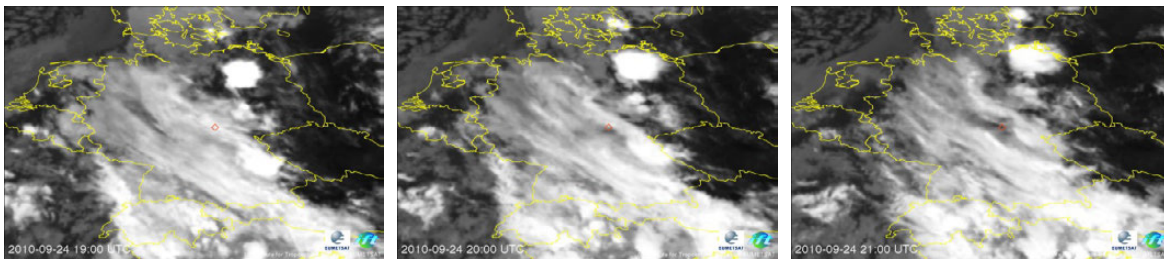


Fig. F 2 IR-satellite picture on 24-09-2010, 19, 20 and 21 UTC (source: ©TROPOS/EUMETSAT).

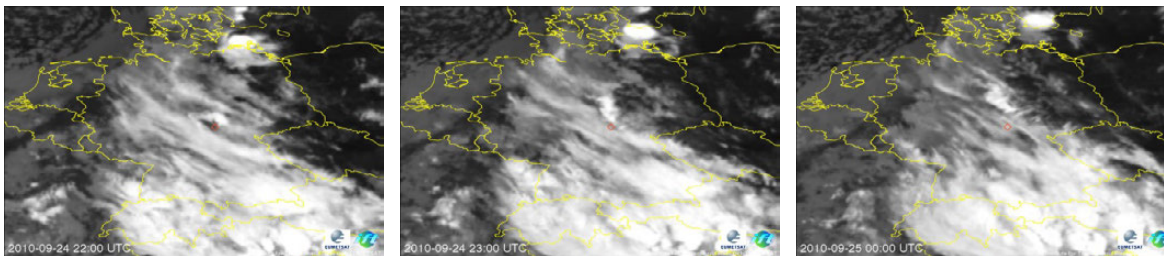


Fig. F 3 IR-satellite picture on 24-09-2010, 22 and 23 and 25-09-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

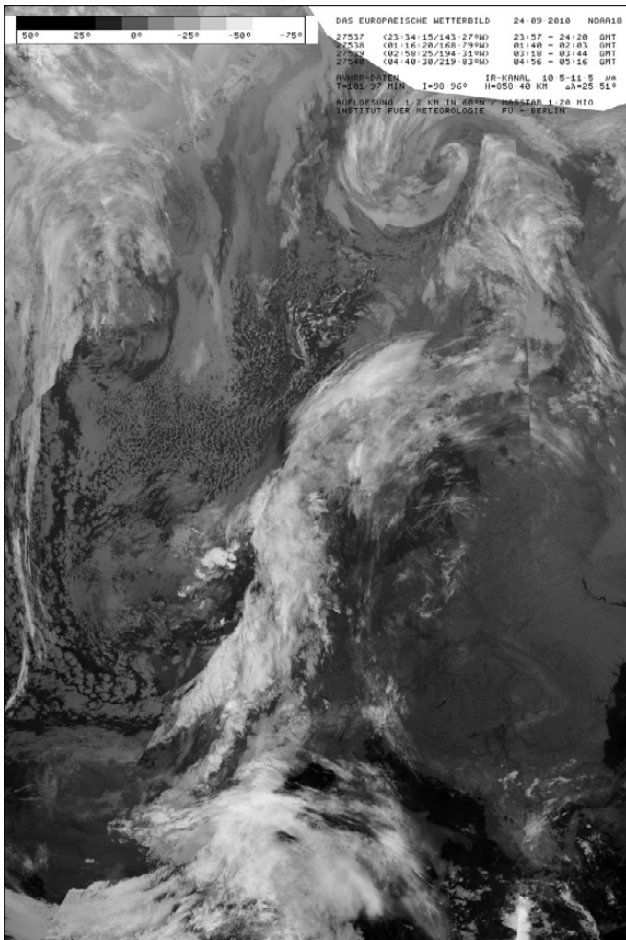


Fig. F 4 NOAA satellite pictures on 24-09-2010 (source: Berliner Wetterkarte e.V., 2010).

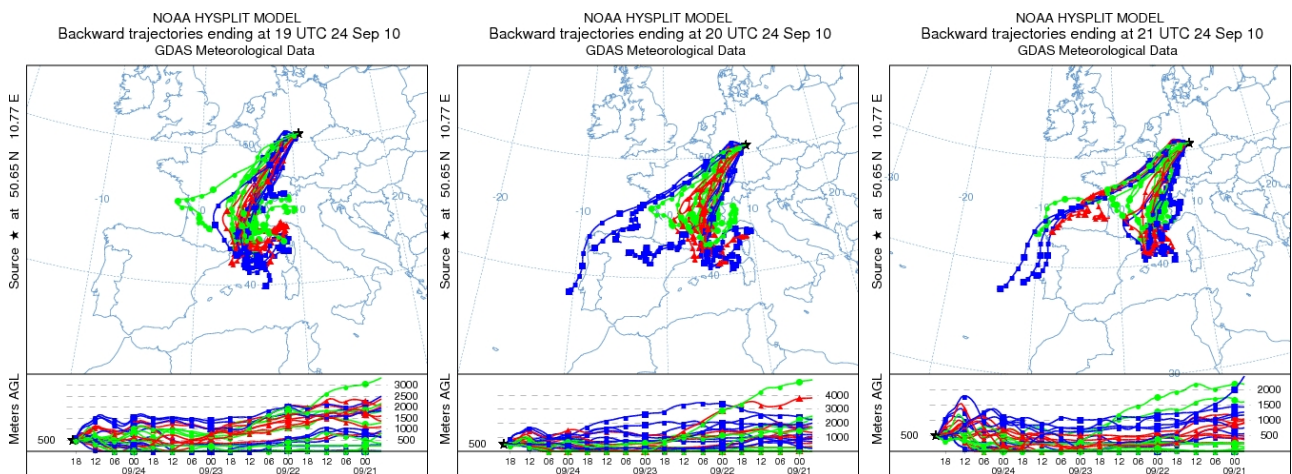


Fig. F 5 Backward trajectories on 24-09-2010, 19, 20 and 21 (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

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

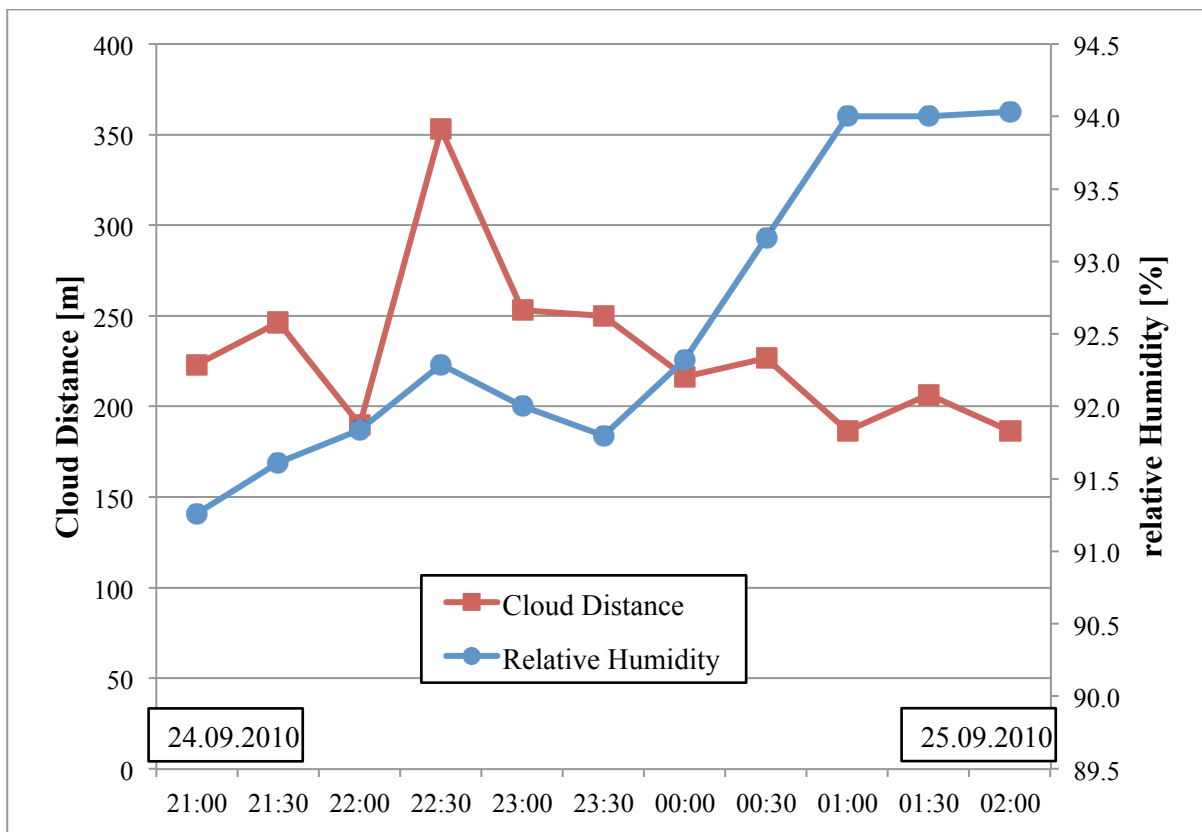


Fig. F 8 Cloud height and relative humidity on cloud event FCE7.1.

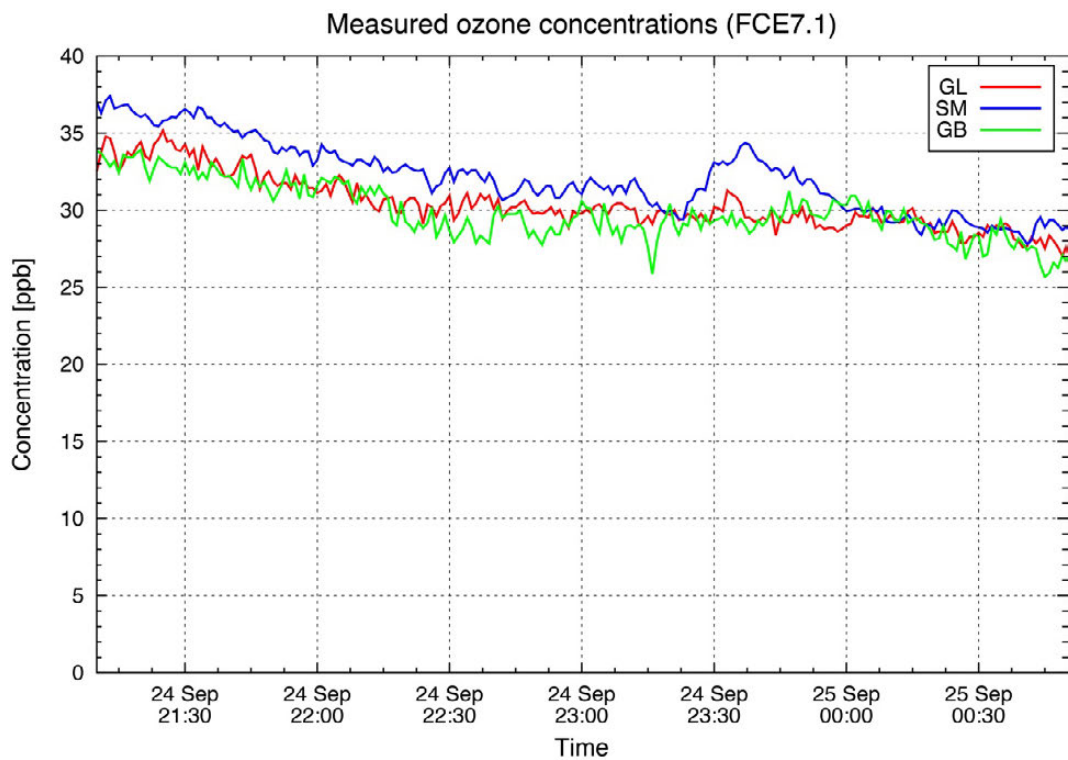


Fig. F 9 Measured ozone concentration over the full event.

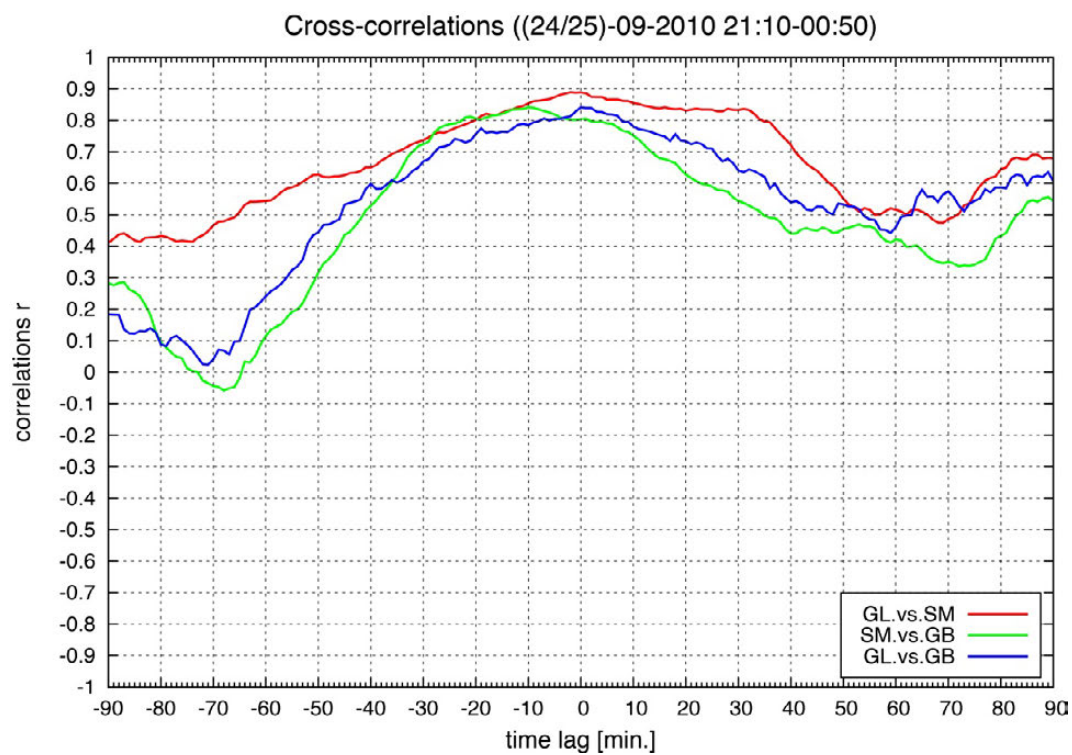


Fig. F 10 Cross-correlation of the full event.

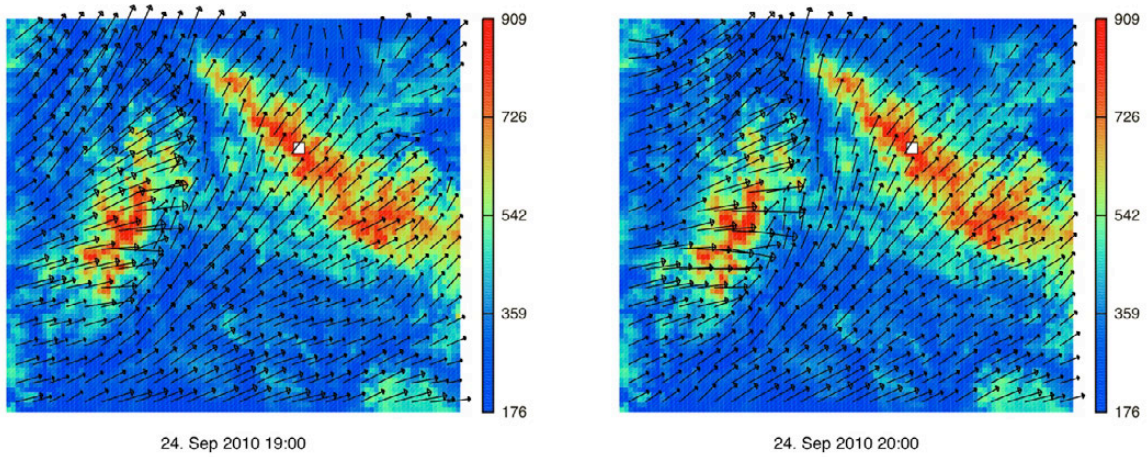


Fig. F 11 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

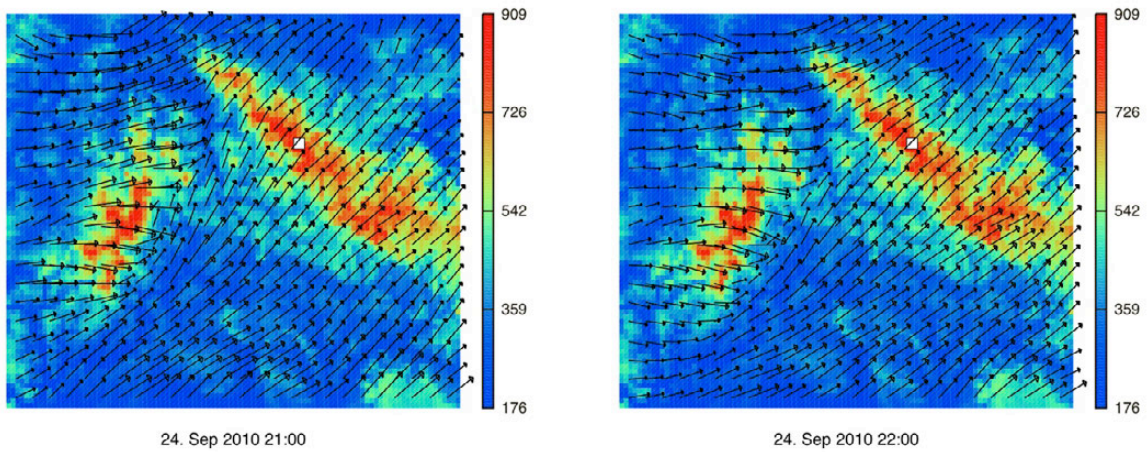


Fig. F 12 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

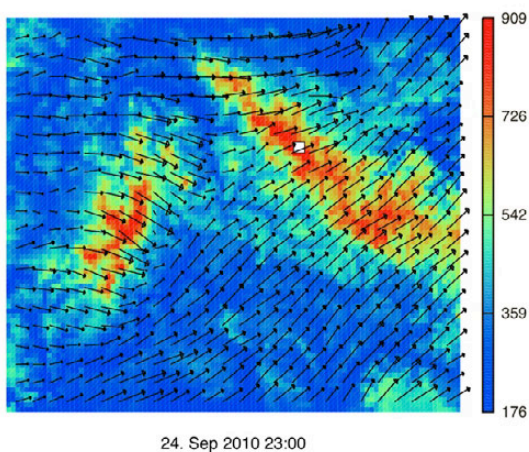
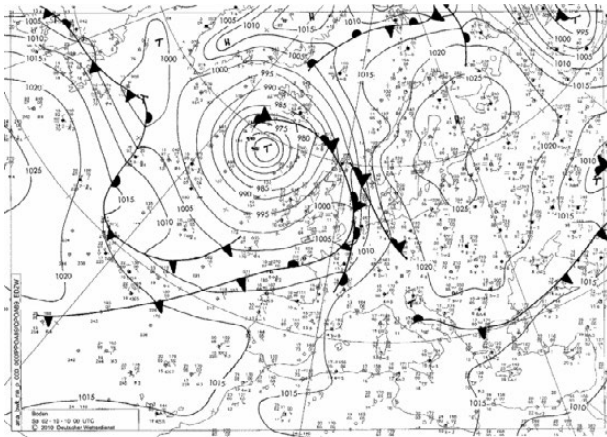


Fig. F 13 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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)).

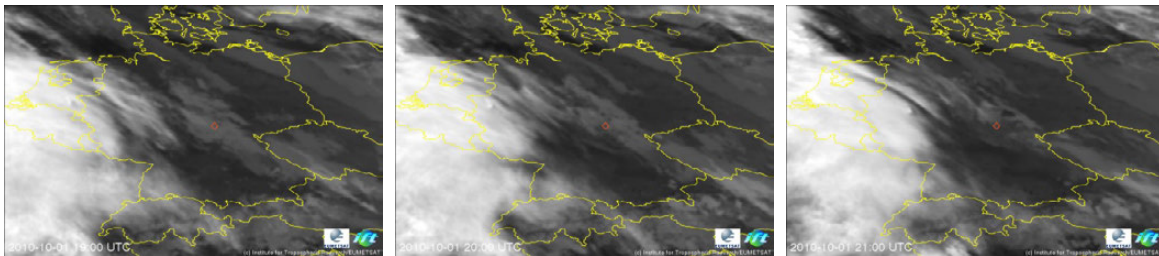


Fig. G 2 IR-satellite picture on 01-10-2010, 19, 20 and 21 UTC (source: ©TROPOS/EUMETSAT).

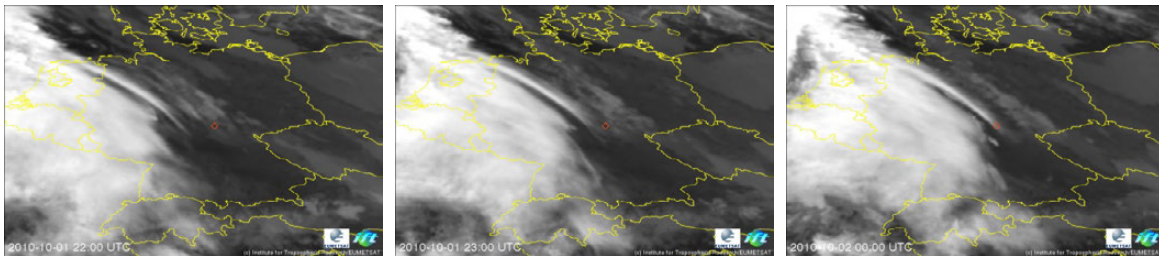


Fig. G 3 IR-satellite picture on 01-10-2010, 22 and 23 and 02 October 00 UTC (source: ©TROPOS/EUMETSAT).

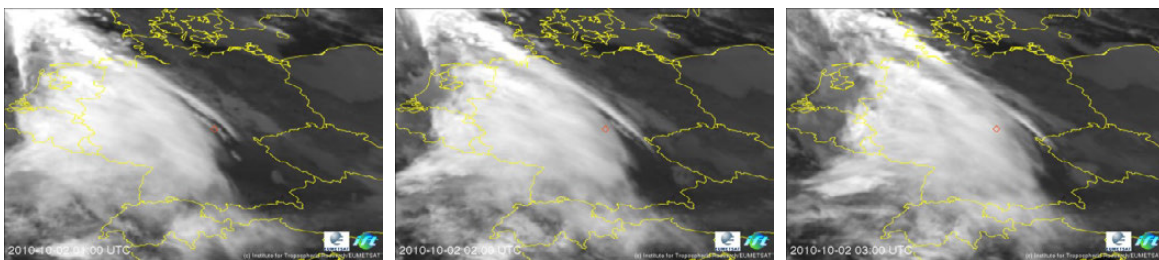


Fig. G 4 IR-satellite picture on 02-10-2010, 01, 02 and 03 UTC (source: ©TROPOS/EUMETSAT).

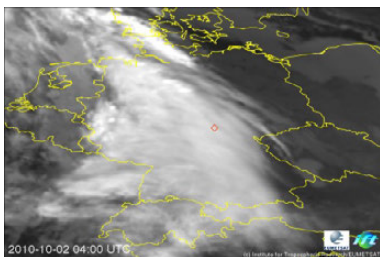


Fig. G 5 IR-satellite picture on 02-10-2010, 04 (source: ©TROPOS/EUMETSAT).

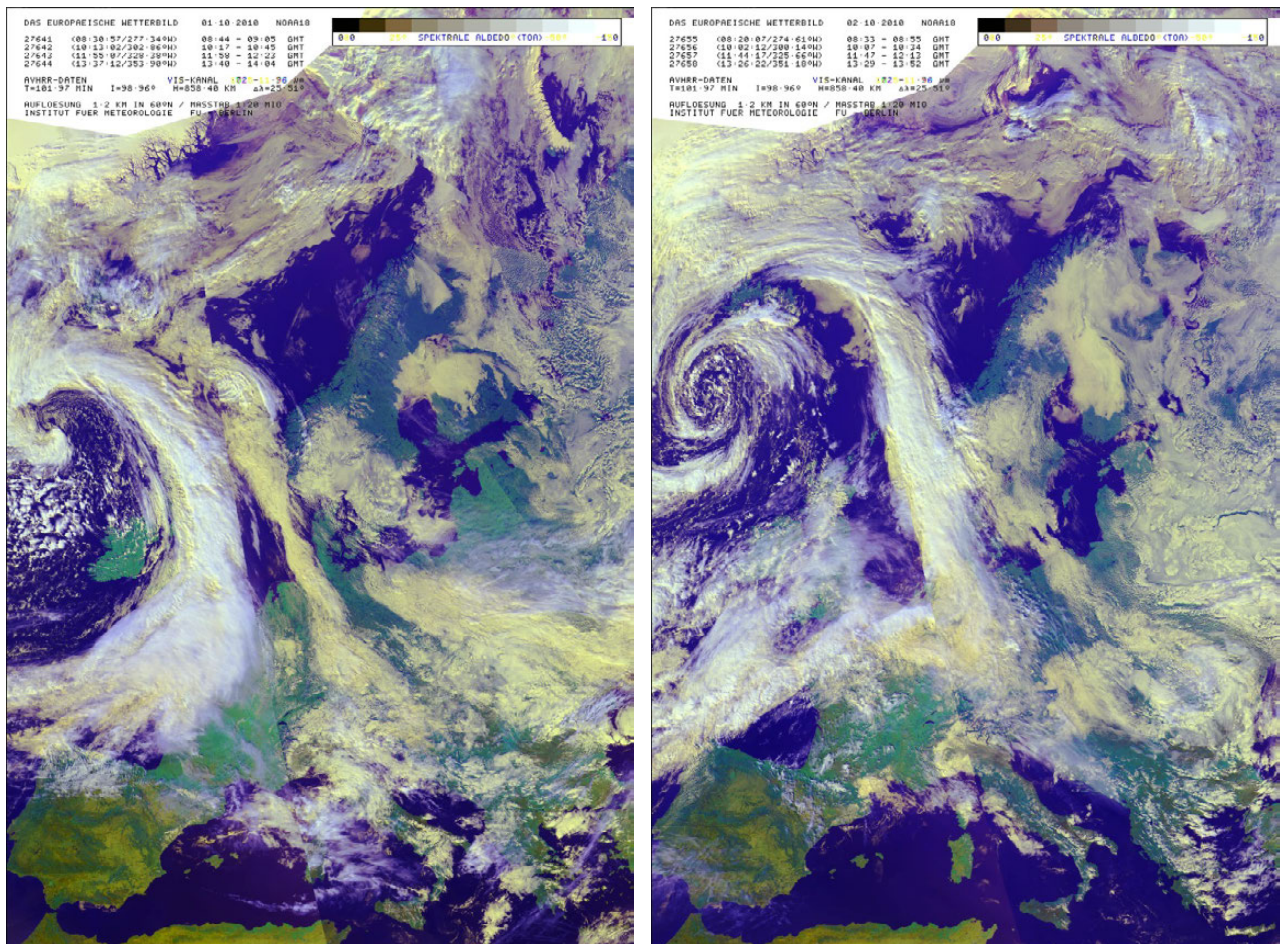


Fig. G 6 NOAA satellite pictures on 01-10-2010 and on 02-10-2010 (source: Berliner Wetterkarte e.V., 2010).

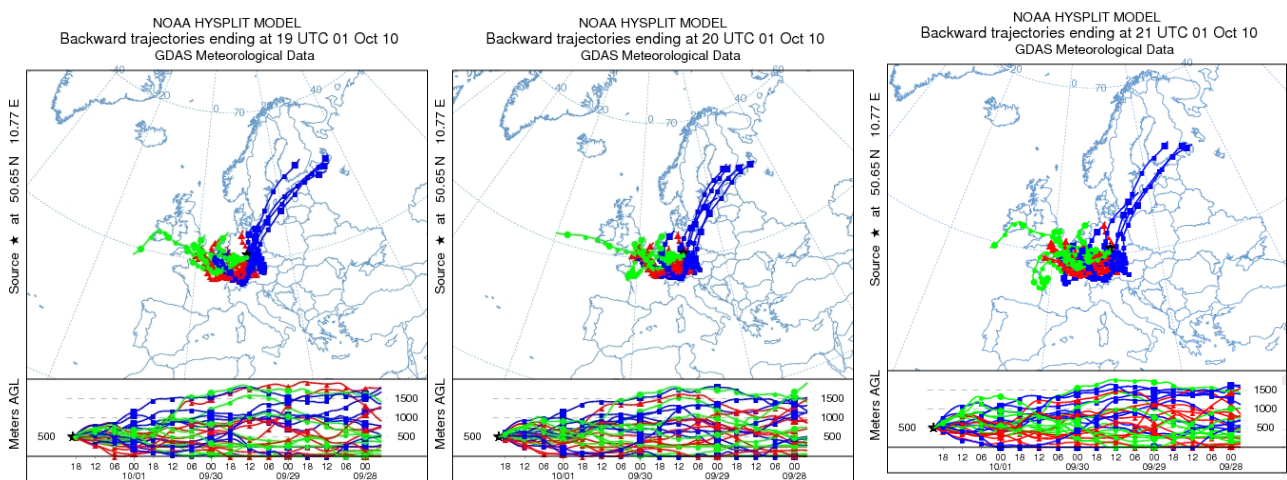


Fig. G 7 Backward trajectories on 01-10-2010, 19, 20 and 21 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

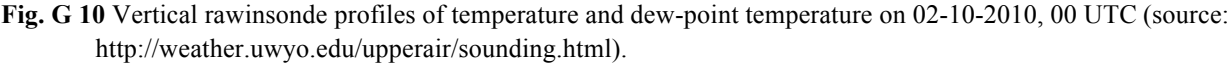
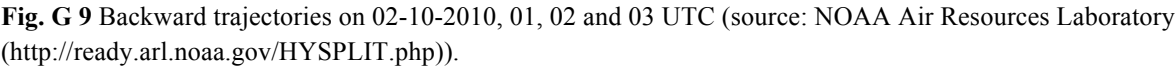
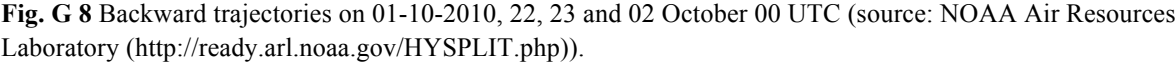


Table G 1 Locally measured meteorological data at the summit station Schmücke on 01/02-10-2010.

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

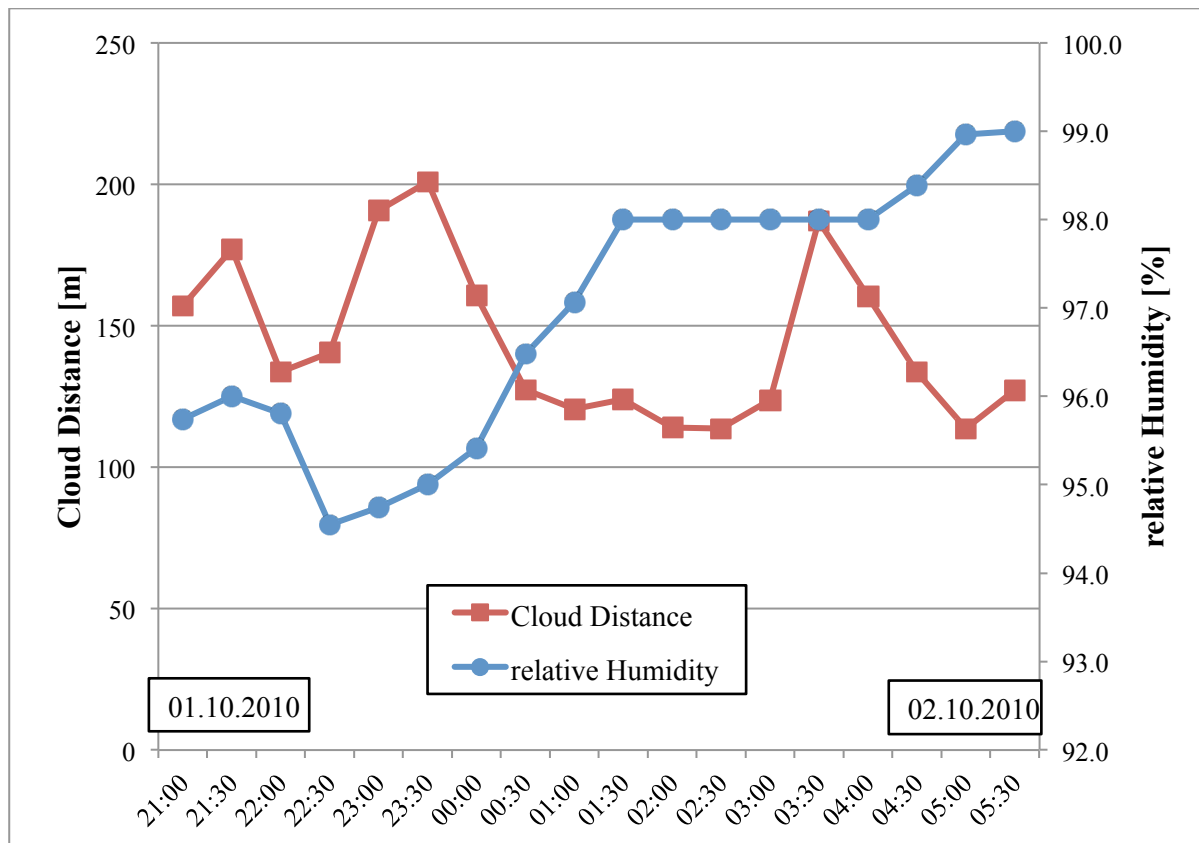


Fig. G 11 Cloud height and relative humidity on cloud event FCE11.2.

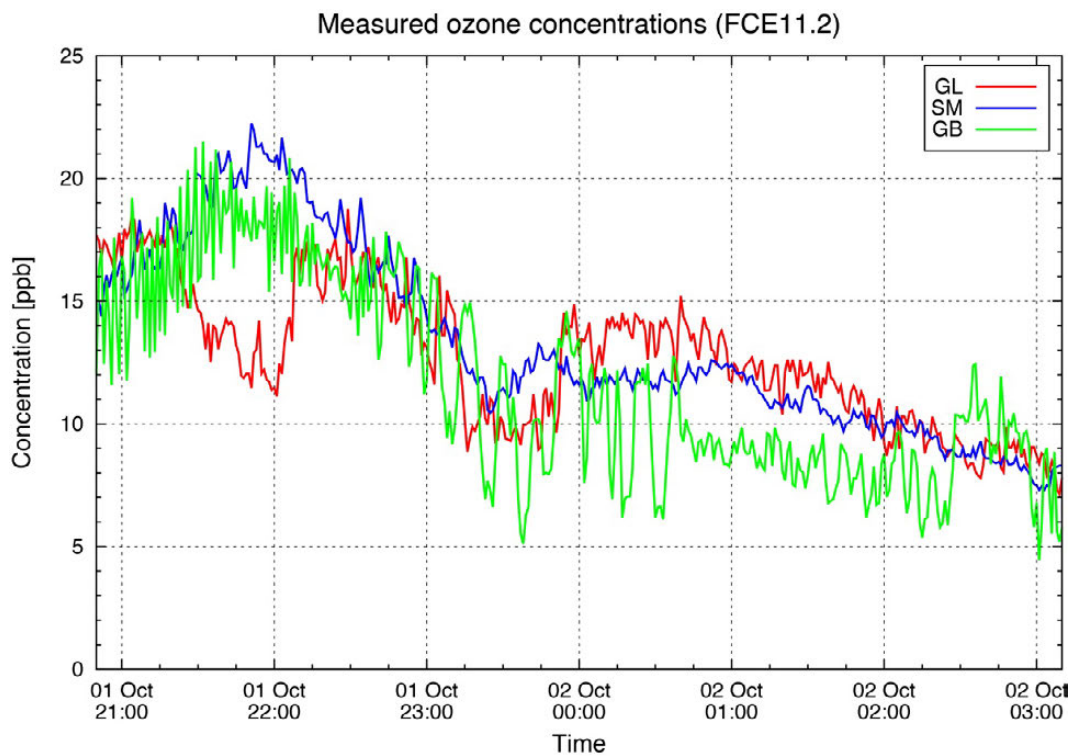


Fig. G 12 Measured ozone concentration over the full event.

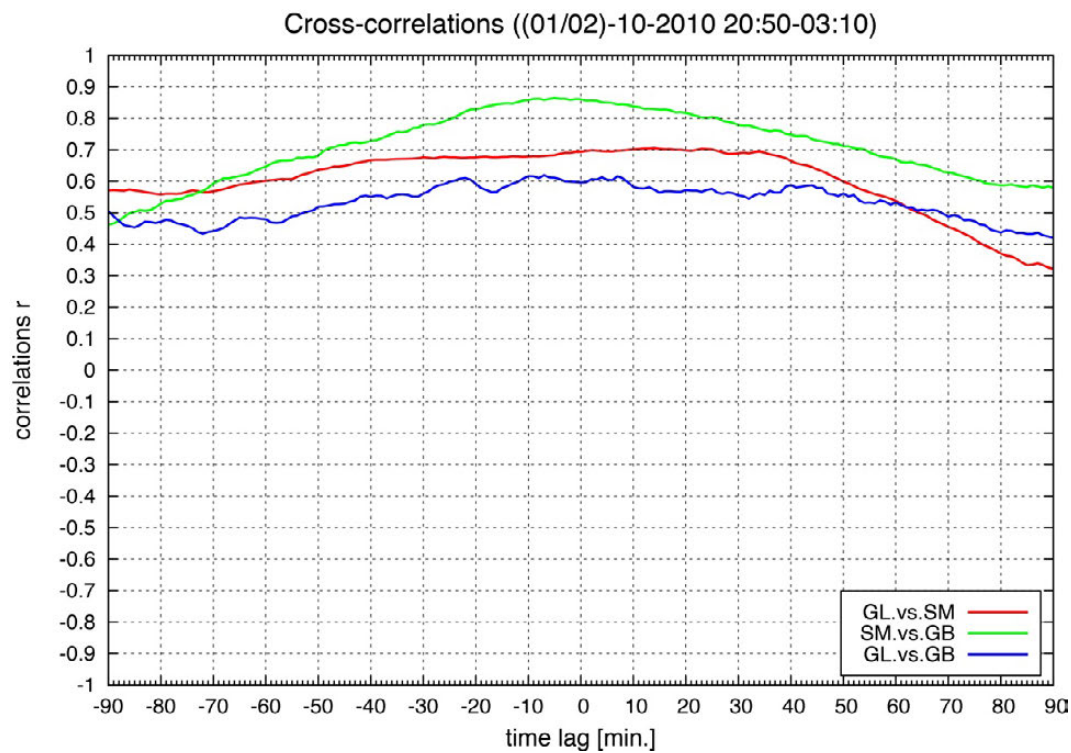


Fig. G 13 Cross-correlation of the full event.

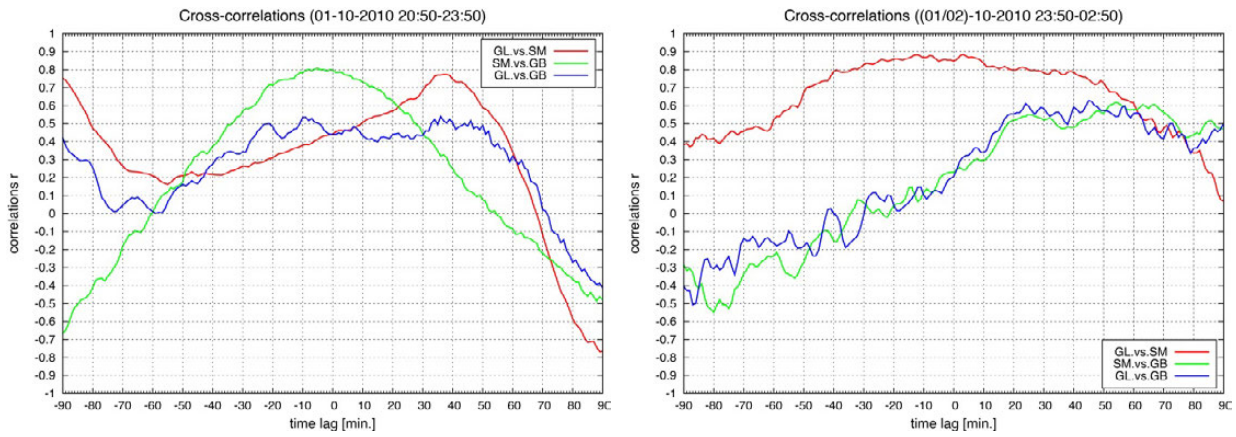


Fig. G 14 Cross-correlation on 24 and 25-09-2010, 20:50 – 23:50 CEST and 23:50 – 02:50 CEST.

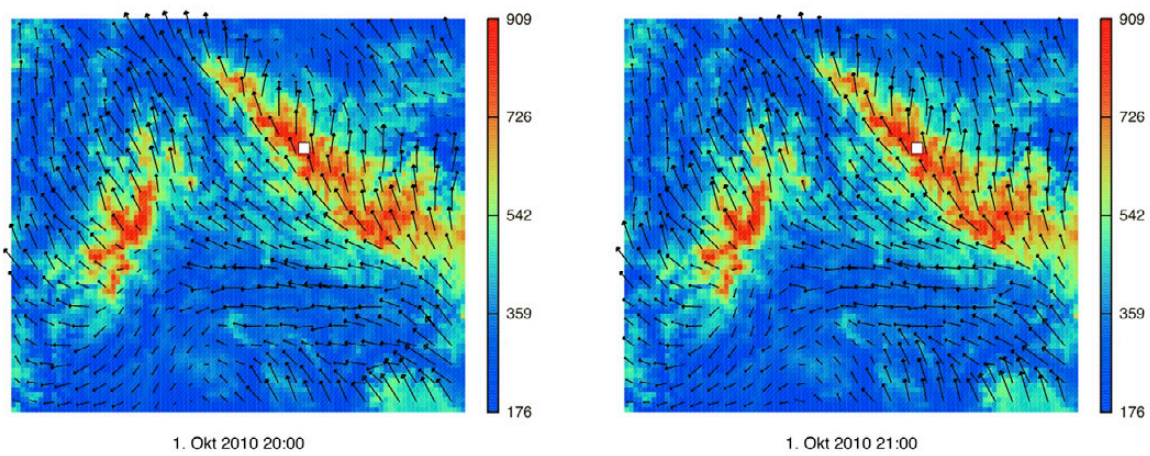


Fig. G 15 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

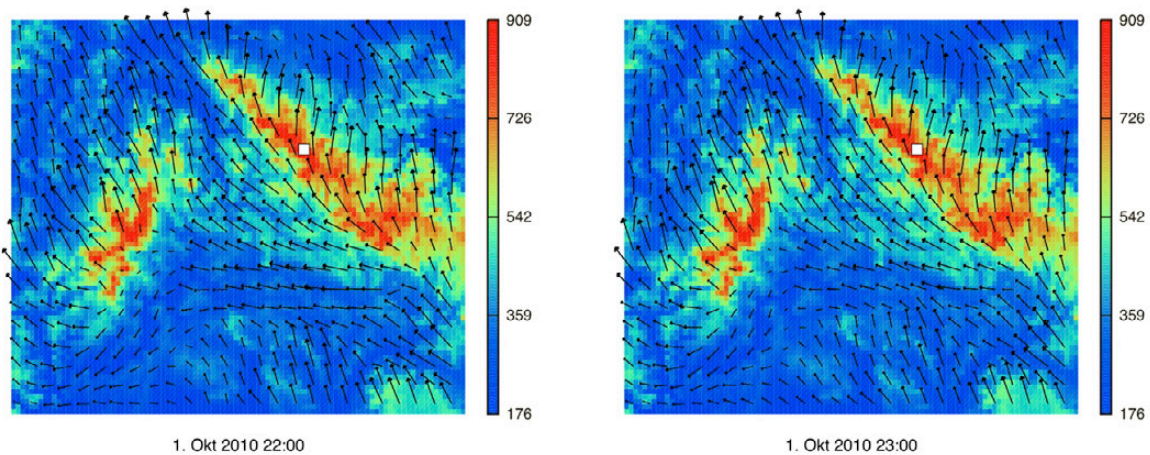


Fig. G 16 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

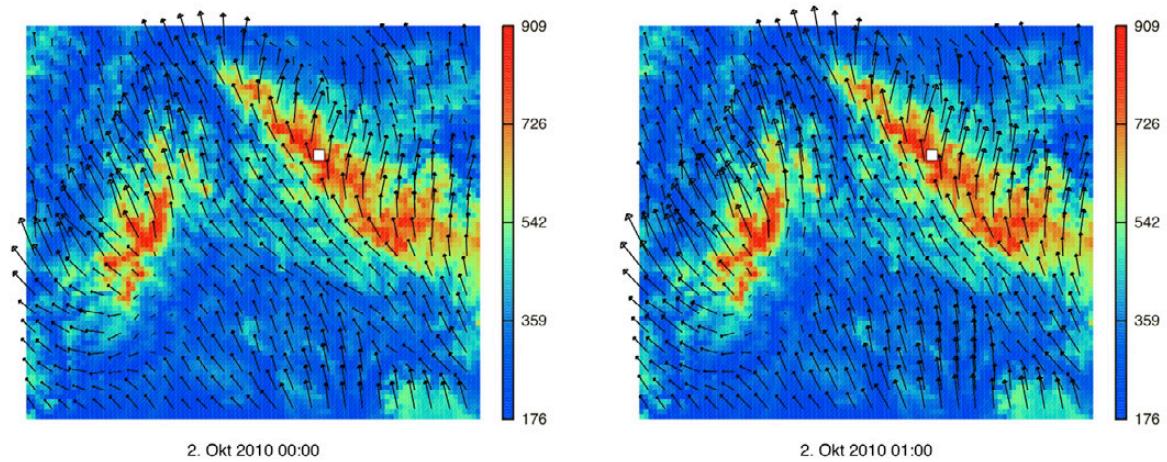


Fig. G 17 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

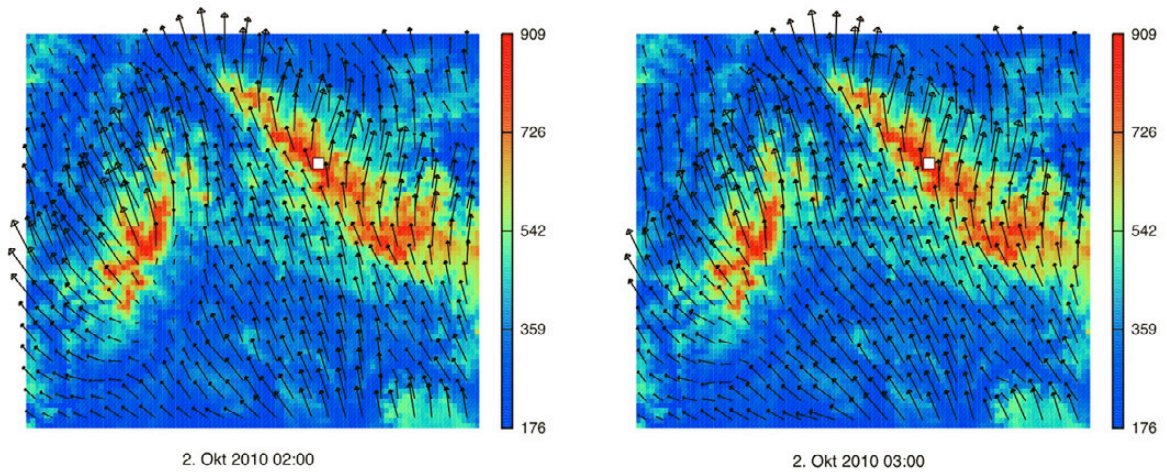


Fig. G 18 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

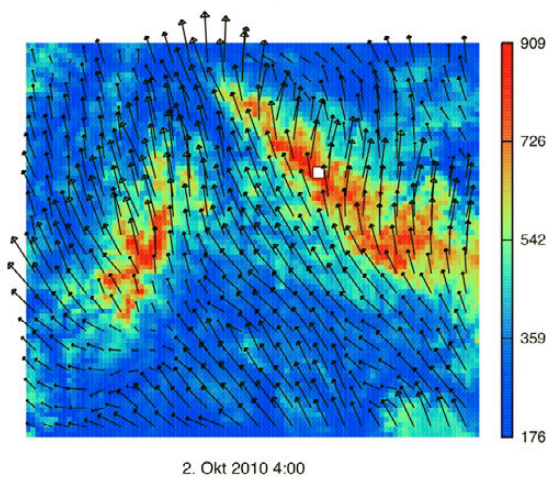


Fig. G 19 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

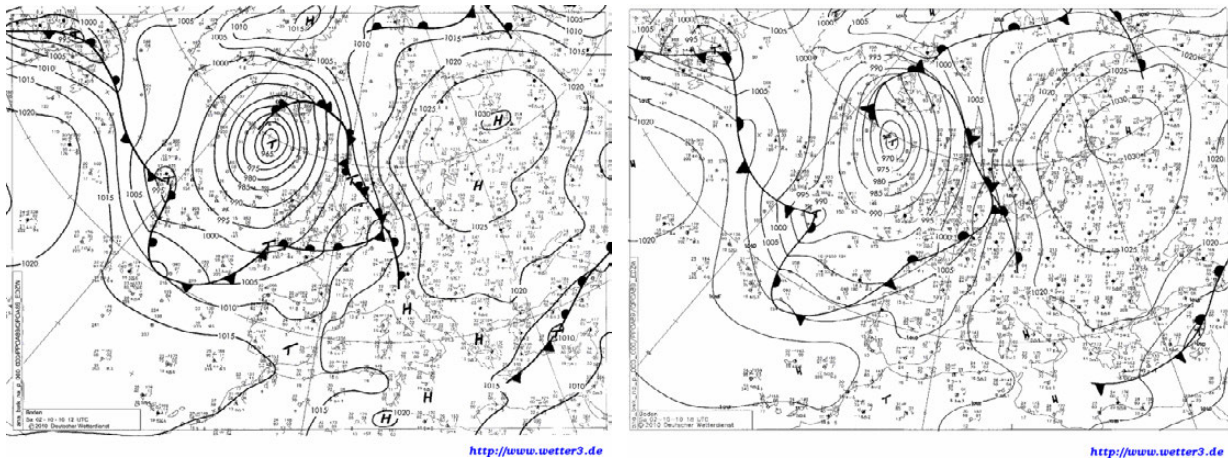


Fig. H 1 Surface weather charts on 02-10-2010, 12 and 18 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

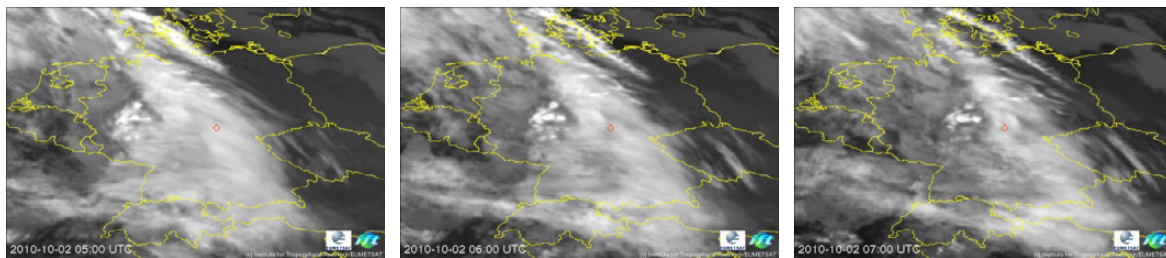


Fig. H 2 IR-satellite picture on 02-10-2010, 05, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

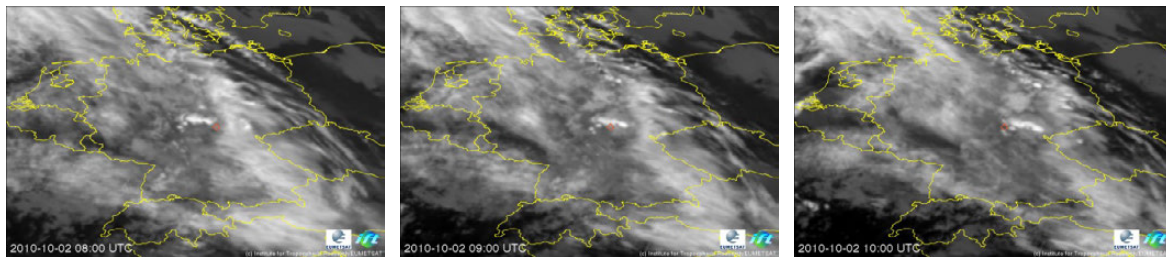


Fig. H 3 IR-satellite picture on 02-10-2010, 08, 09 and 10 UTC (source: ©TROPOS/EUMETSAT).

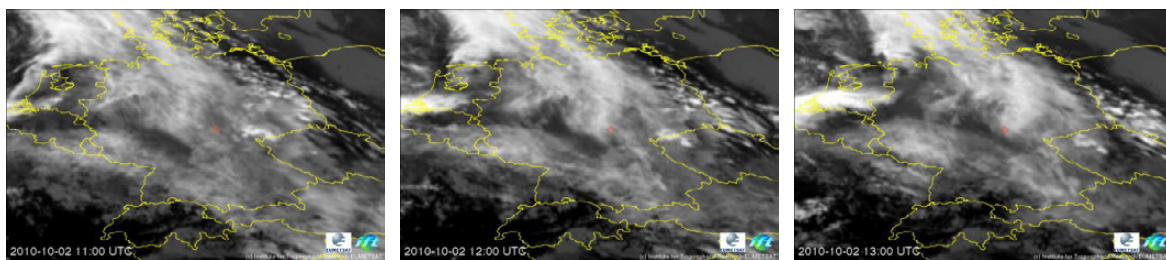


Fig. H 4 IR-satellite picture on 02-10-2010, 11, 12 and 13 UTC (source: ©TROPOS/EUMETSAT).

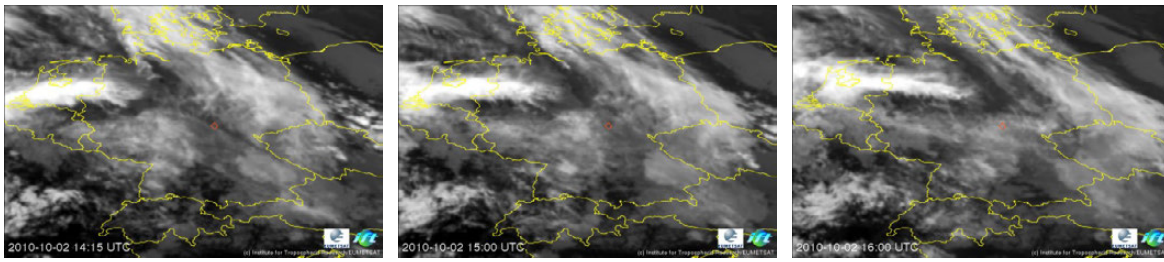


Fig. H 5 IR-satellite picture on 02-10-2010, 14:15, 15 and 16 UTC (source: ©TROPOS/EUMETSAT).

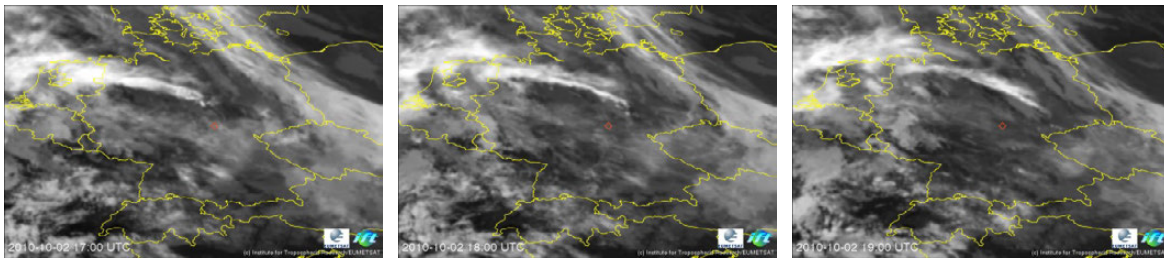


Fig. H 6 IR-satellite picture on 02-10-2010, 17, 18 and 19 UTC (source: ©TROPOS/EUMETSAT).

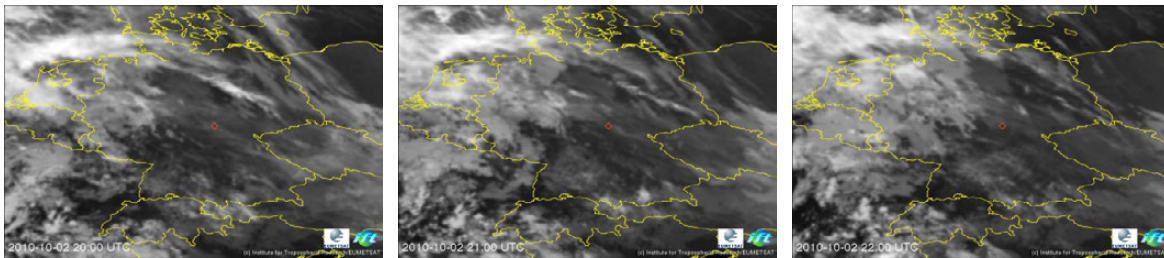


Fig. H 7 IR-satellite picture on 02-10-2010, 20, 21 and 22 UTC (source: ©TROPOS/EUMETSAT).

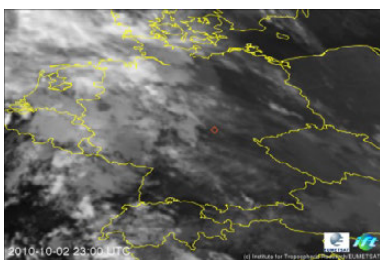


Fig. H 8 IR-satellite picture on 02-10-2010, 23 UTC (source: ©TROPOS/EUMETSAT).



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

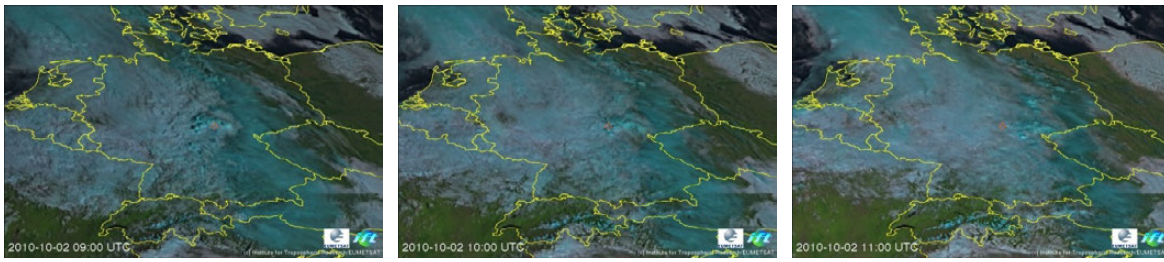


Fig. H 10 VIS-satellite picture on 02-10-2010, 09, 10 and 11 UTC (source: ©TROPOS/EUMETSAT).

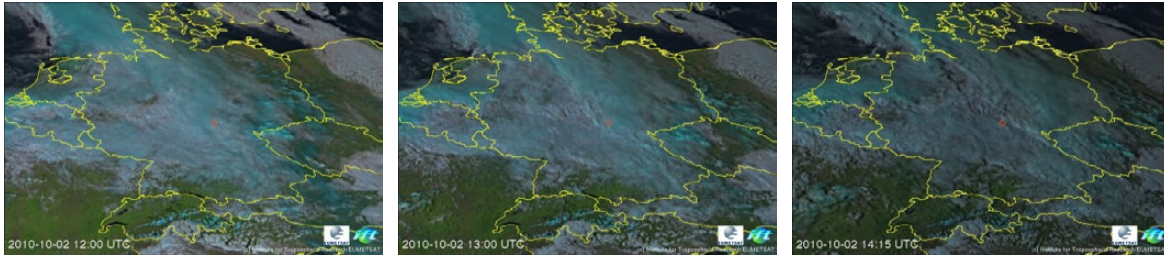


Fig. H 11 VIS-satellite picture on 02-10-2010, 12, 13 and 14:15 UTC (source: ©TROPOS/EUMETSAT).

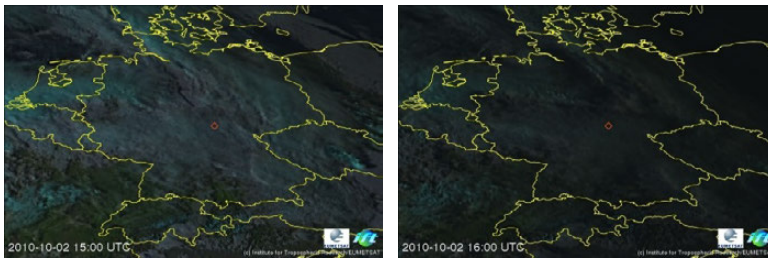


Fig. H 12 VIS-satellite picture on 02-10-2010, 15 and 16 UTC (source: ©TROPOS/EUMETSAT).

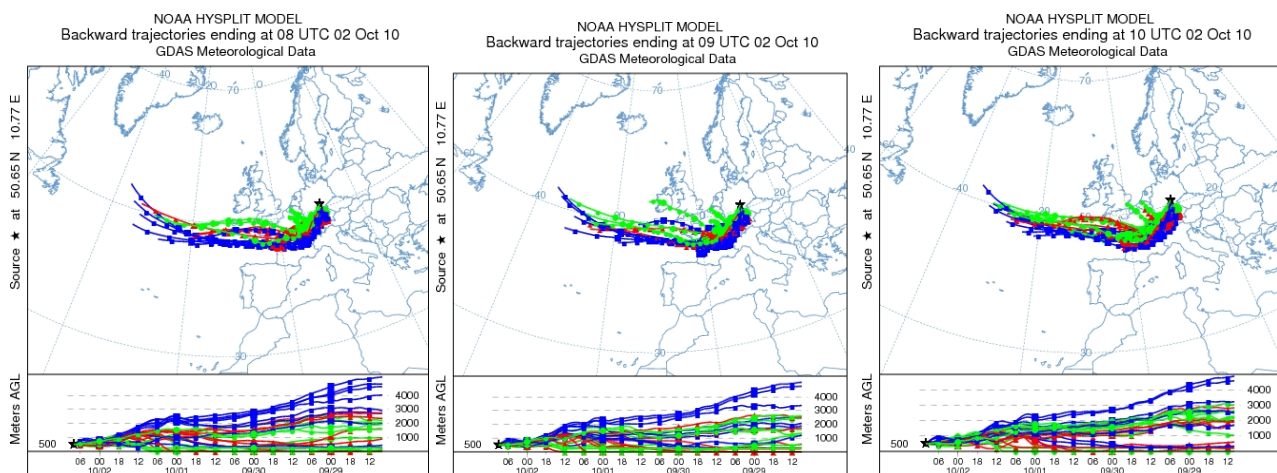


Fig. H 15 Backward trajectories on 02-10-2010, 08; 09 and 10 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

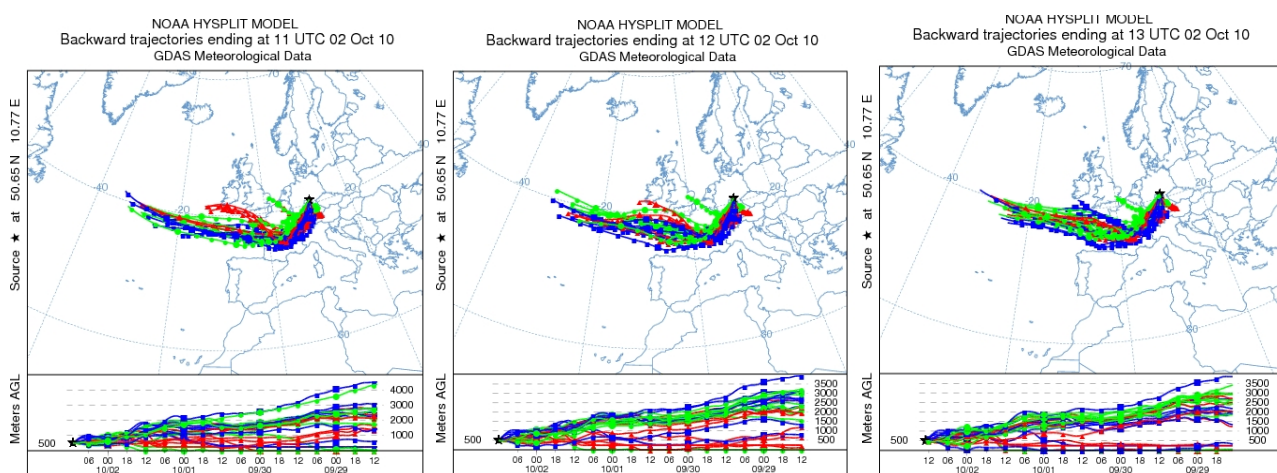


Fig. H 16 Backward trajectories on 02-10-2010, 11; 12 and 13 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

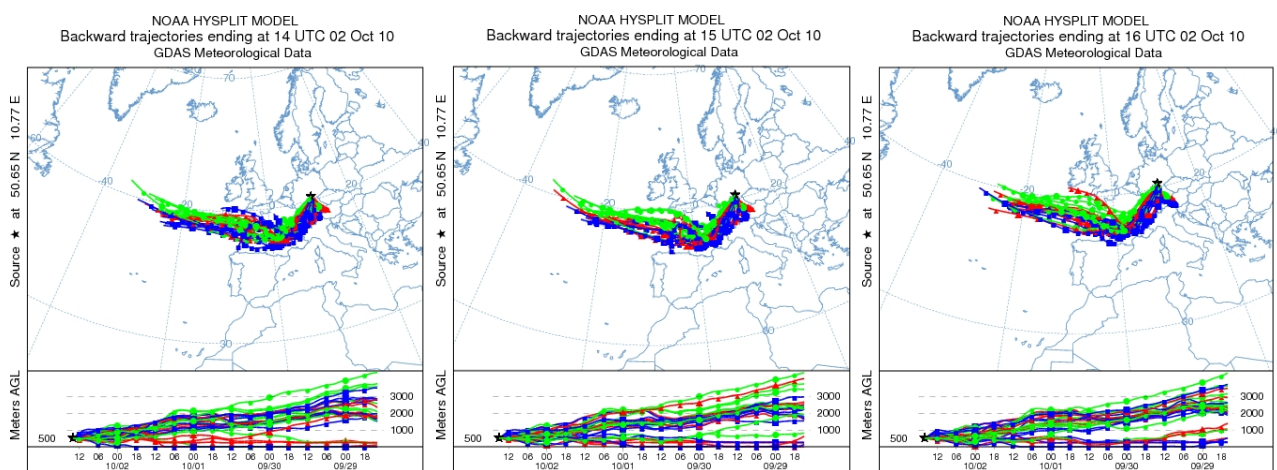


Fig. H 17 Backward trajectories on 02-10-2010, 14; 15 and 16 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

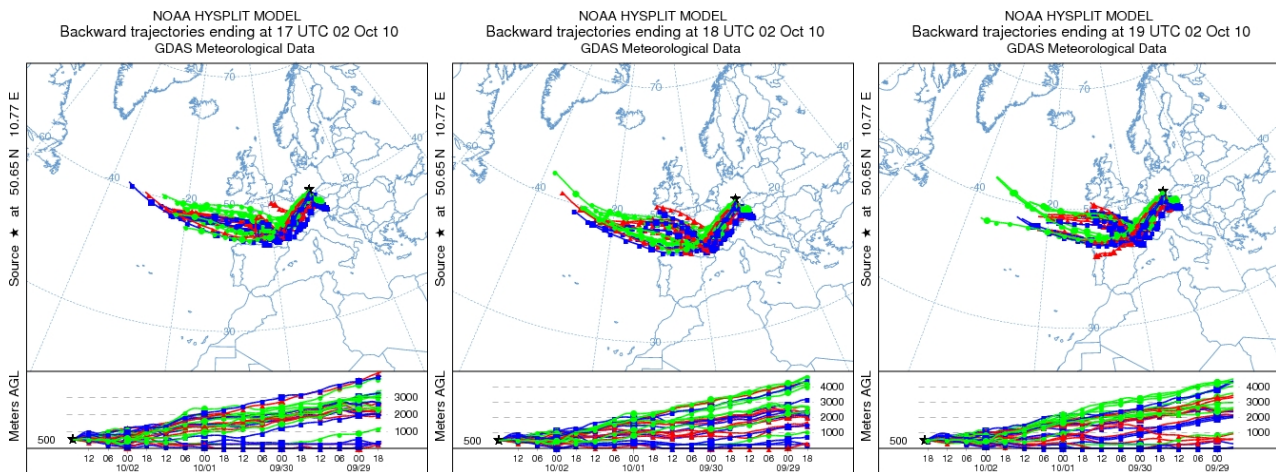


Fig. H 18 Backward trajectories on 02-10-2010, 17; 18 and 19 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

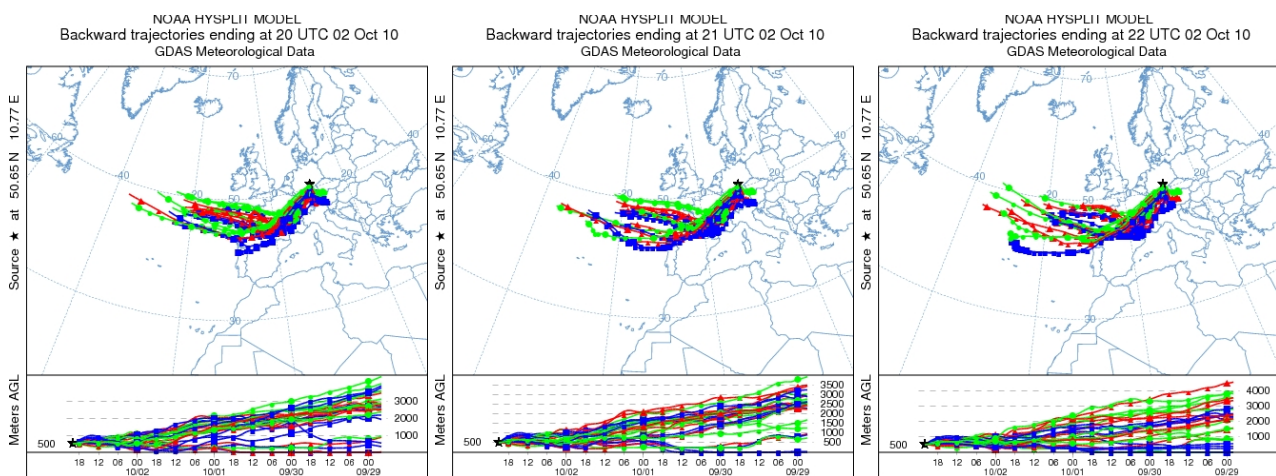


Fig. H 19 Backward trajectories on 02-10-2010, 20; 21 and 22 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

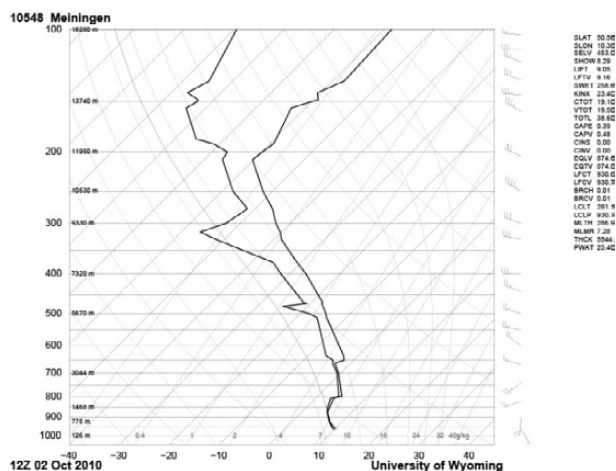


Fig. H 20 Vertical rawinsonde profiles of temperature and dew-point temperature on 02-10-2010, 12 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

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 [°]
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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
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

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
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
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

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
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

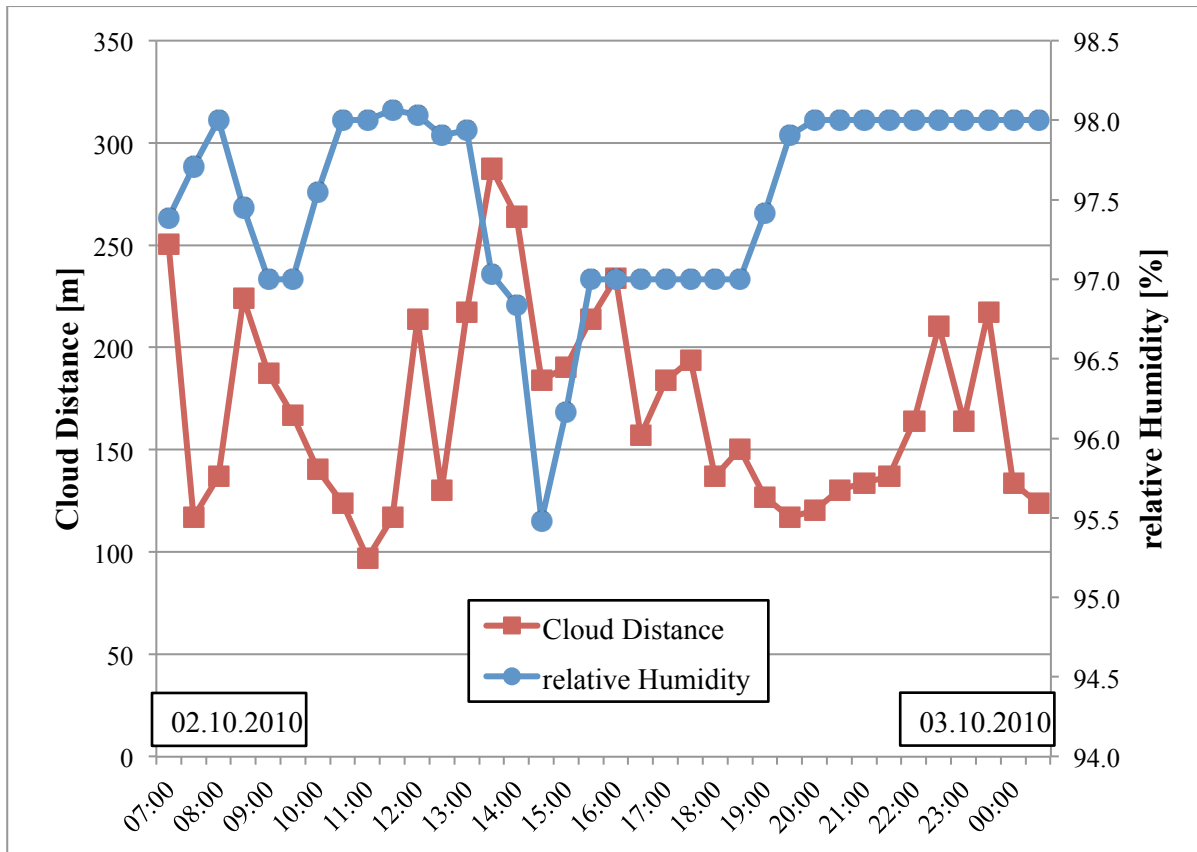


Fig. H 21 Cloud height and relative humidity on cloud event FCE11.3.

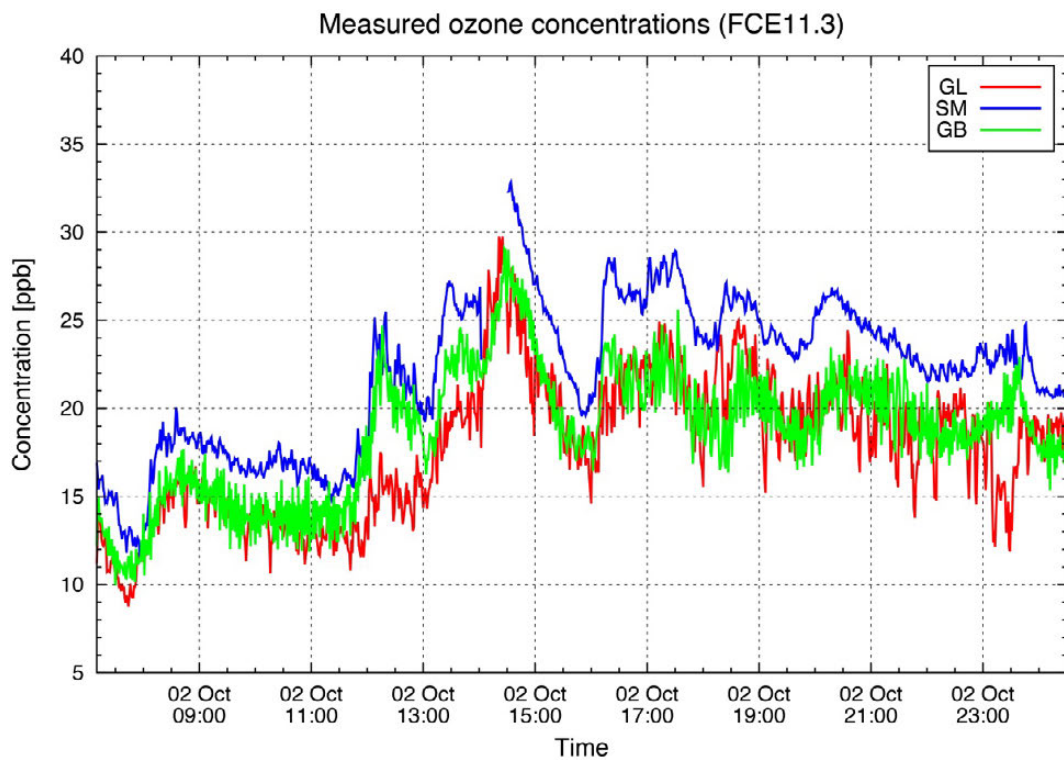


Fig. H 22 Measured ozone concentration over the full event.

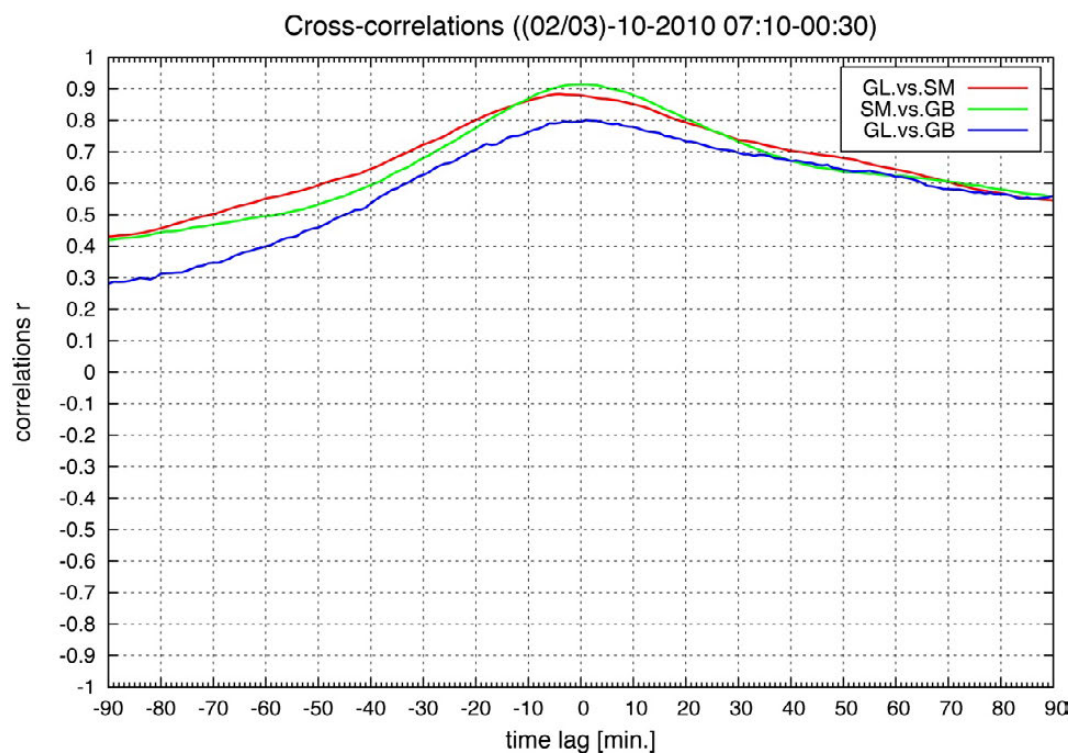


Fig. H 23 Cross-correlation of the full event.

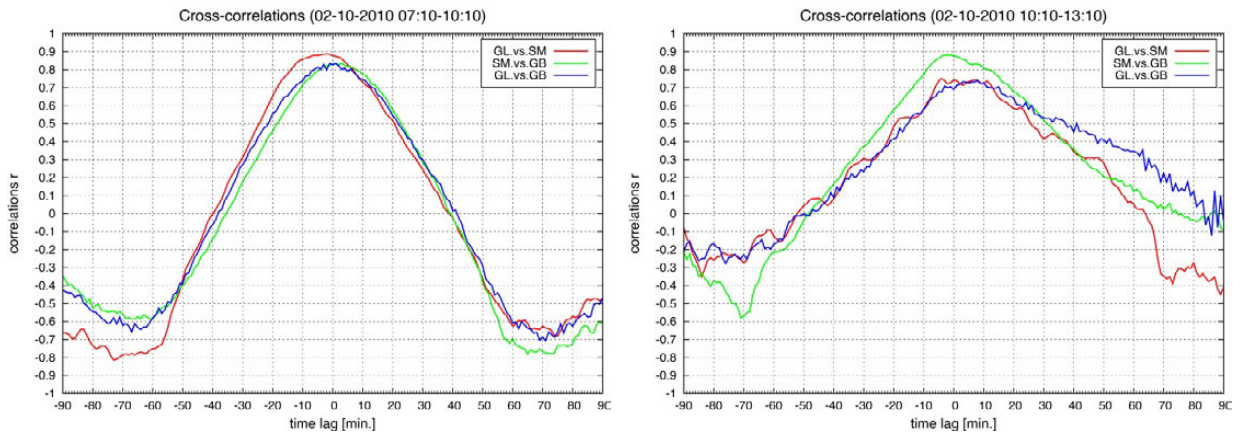


Fig. H 24 Cross-correlation on 02-10-2010, 07:10 – 10:10 CEST and 10:10 – 13:10 CEST.

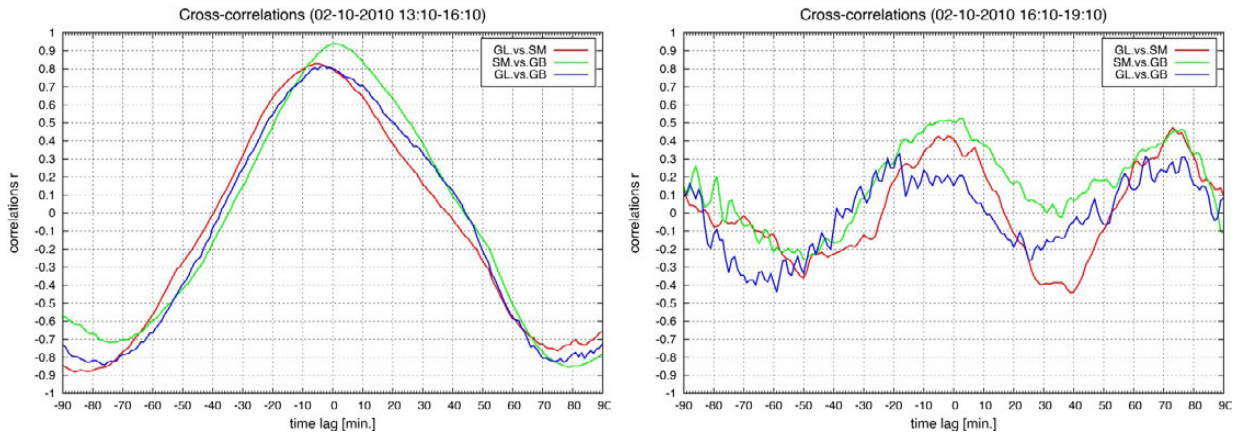


Fig. H 25 Cross-correlation on 02-10-2010, 13:10 – 16:10 CEST and 16:10 – 19:10 CEST.

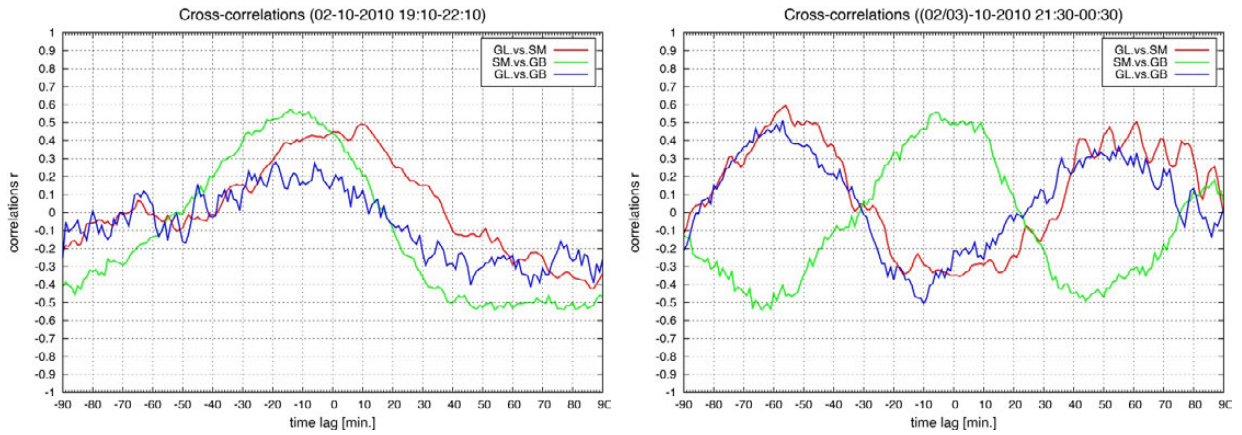


Fig. H 26 Cross-correlation on 02 and 03-10-2010, 19:10 – 22:10 CEST and 21:30 – 00:30 CEST.

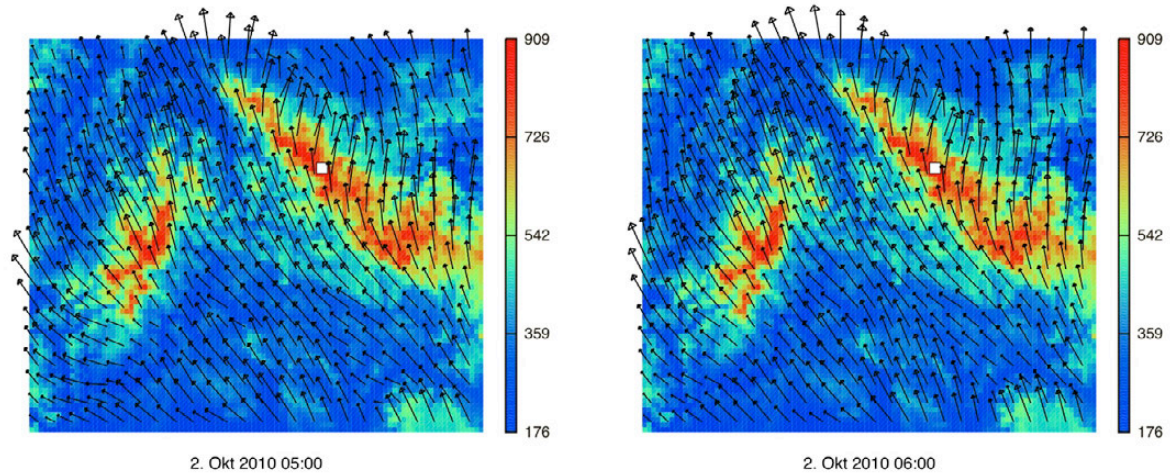


Fig. H 27 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

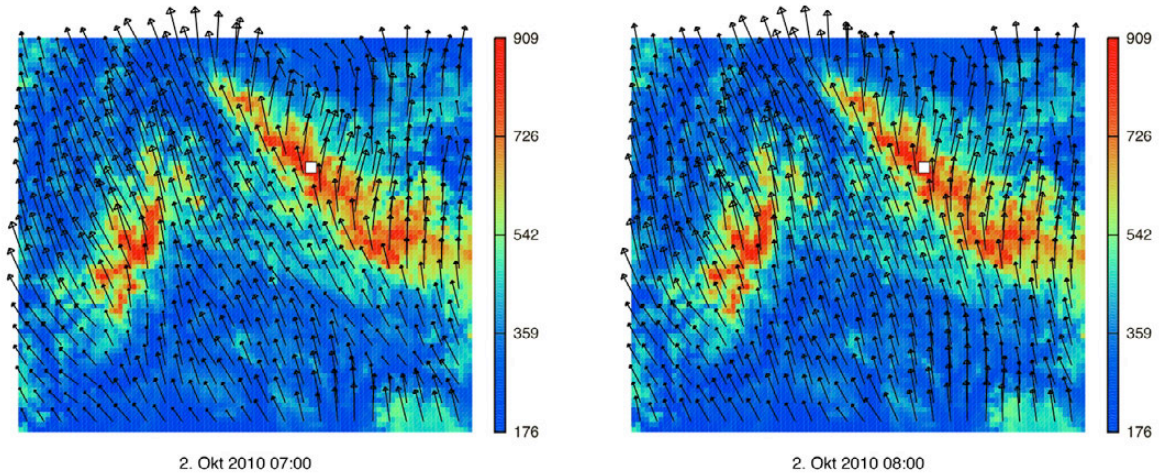


Fig. H 28 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

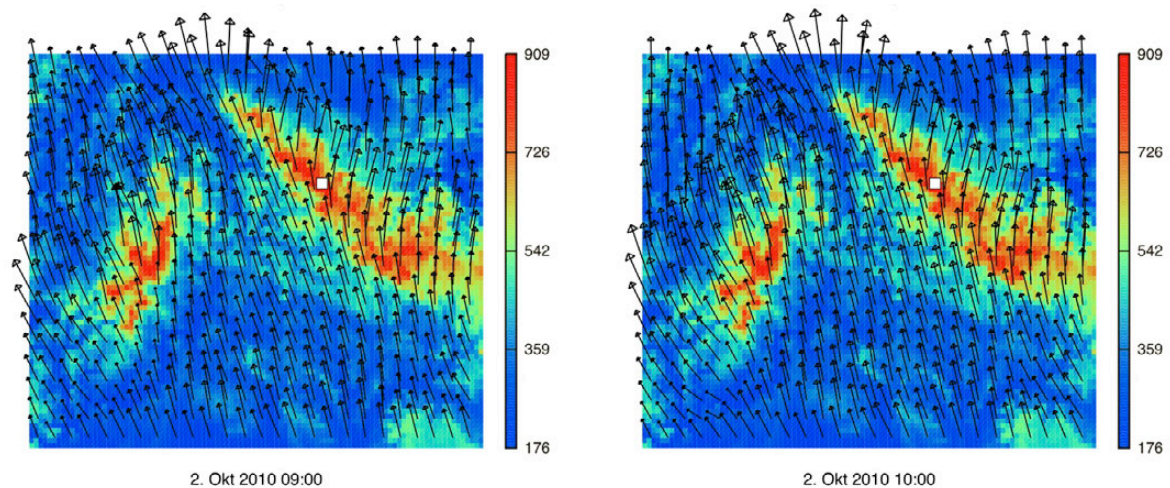


Fig. H 29 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

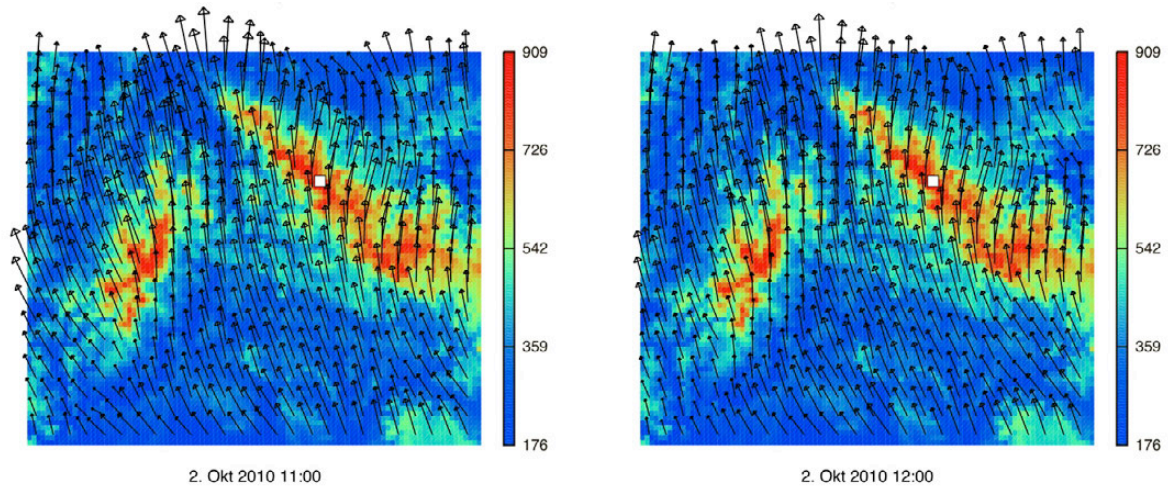


Fig. H 30 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

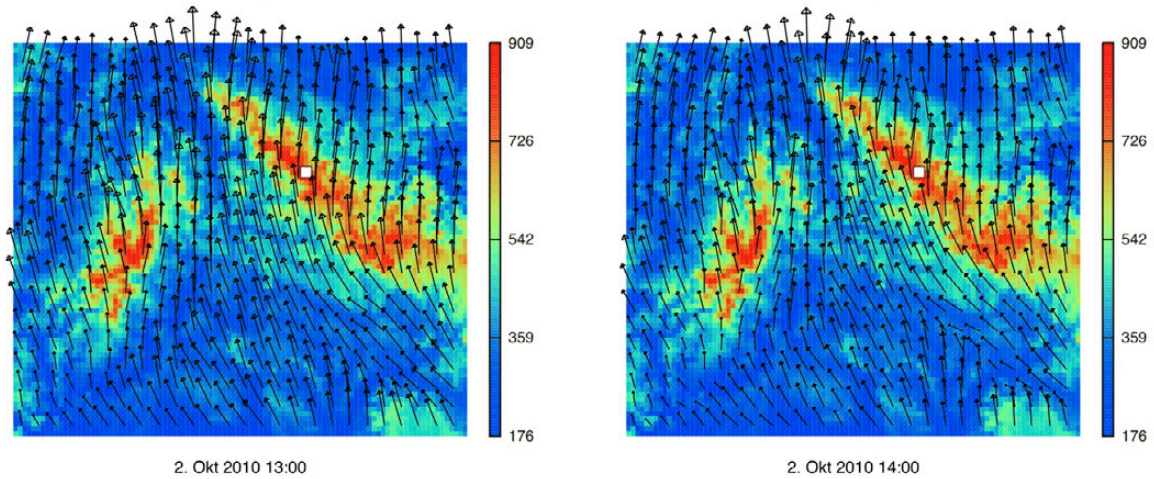


Fig. H 31 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

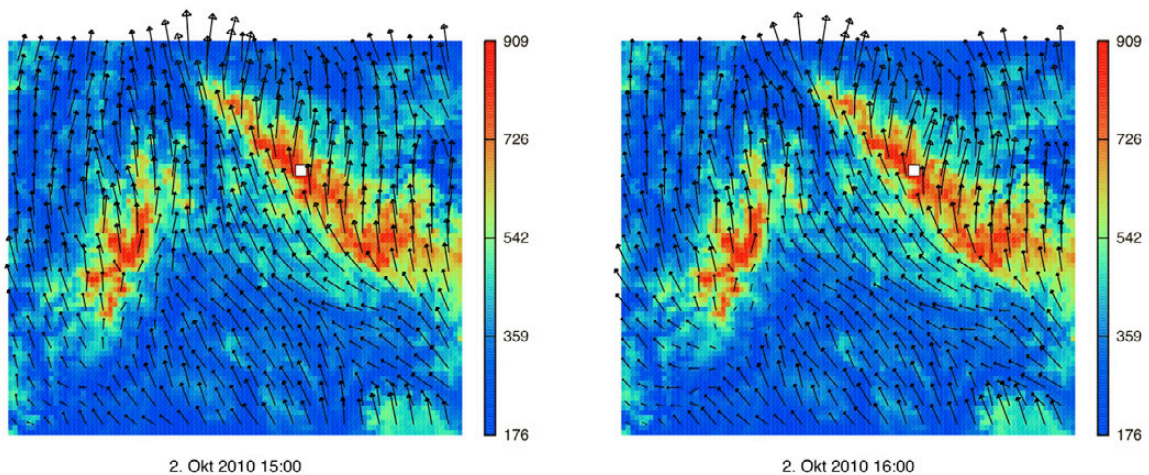


Fig. H 32 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

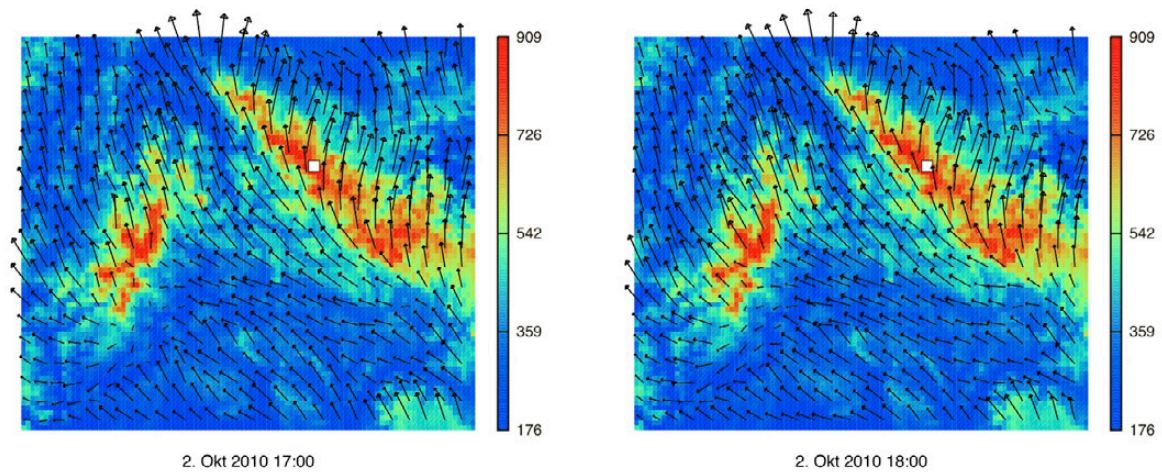


Fig. H 33 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

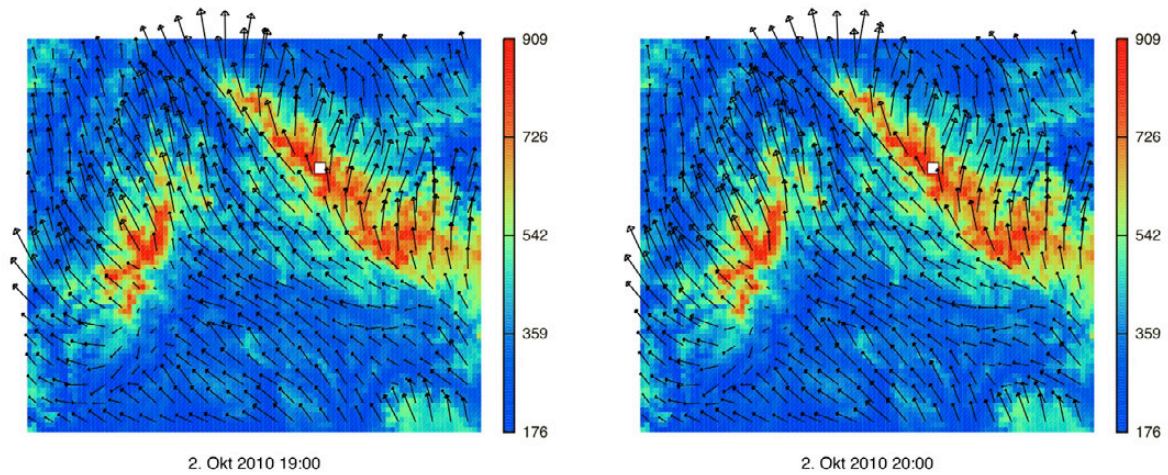


Fig. H 34 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

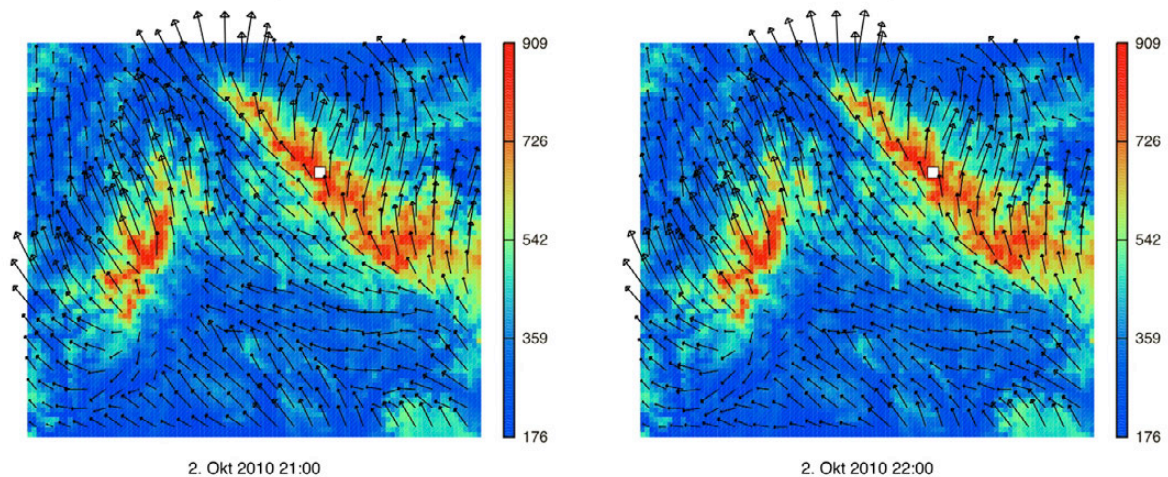


Fig. H 35 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

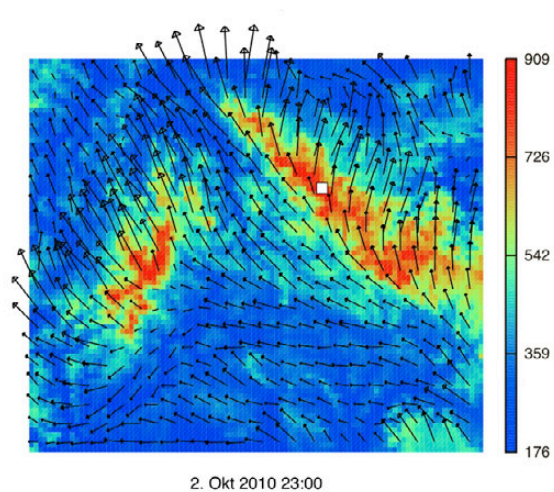


Fig. H 37 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

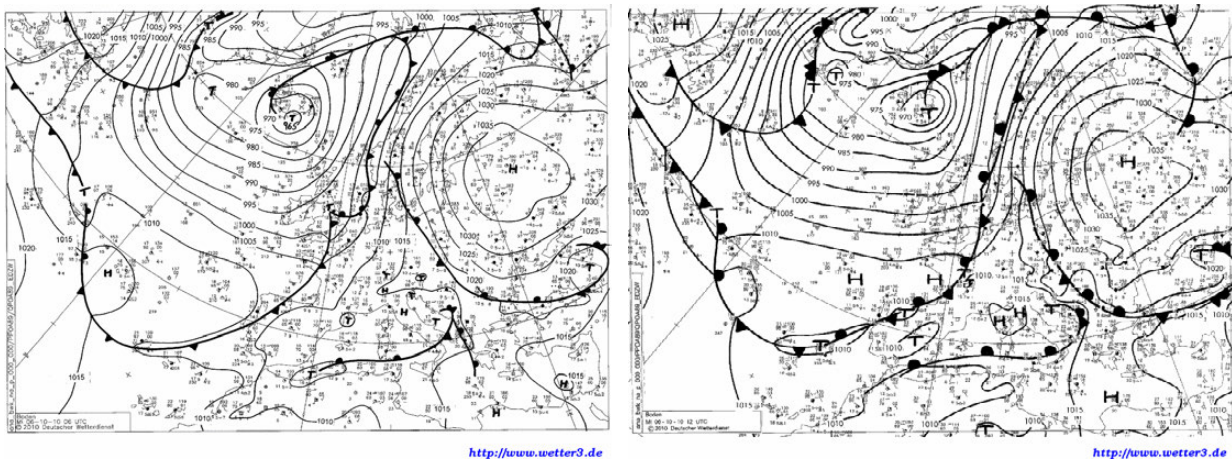


Fig. I 1 Surface weather charts on 06-10-2010, 06 and 12 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

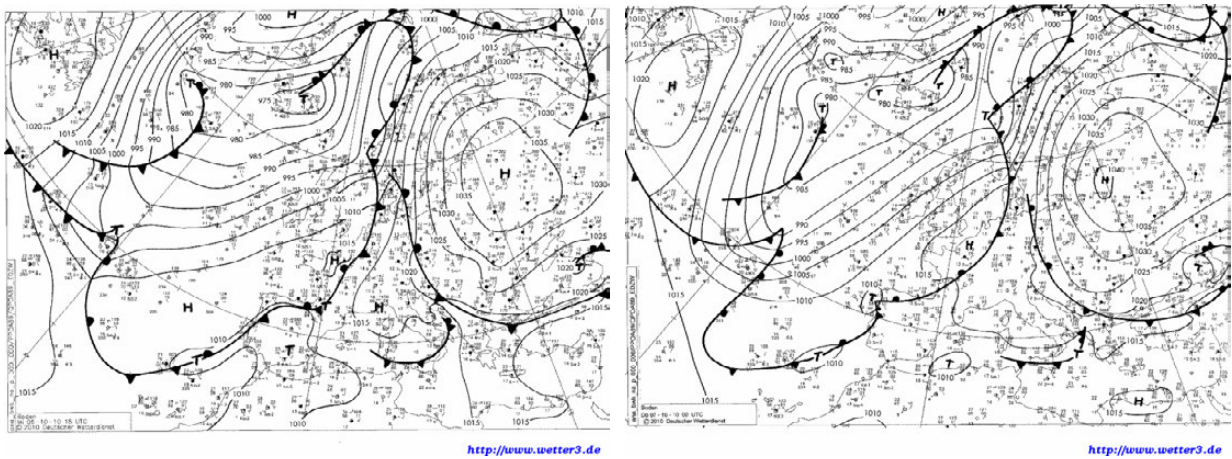


Fig. I 2 Surface weather charts on 06-10-2010, 18 and 07 October, 00 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

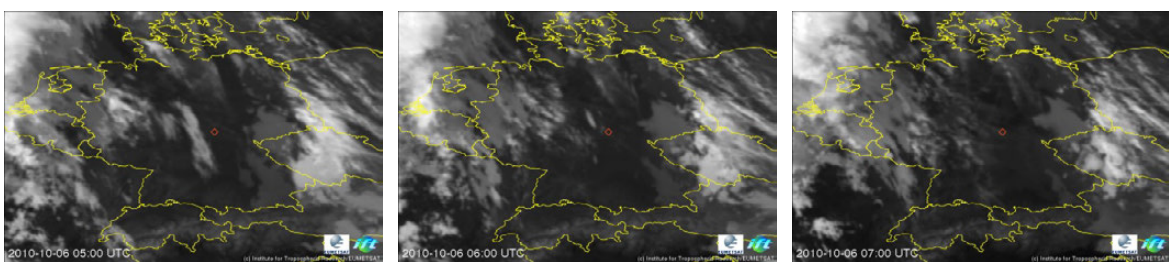


Fig. I 3 IR-satellite picture on 06-10-2010, 05, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

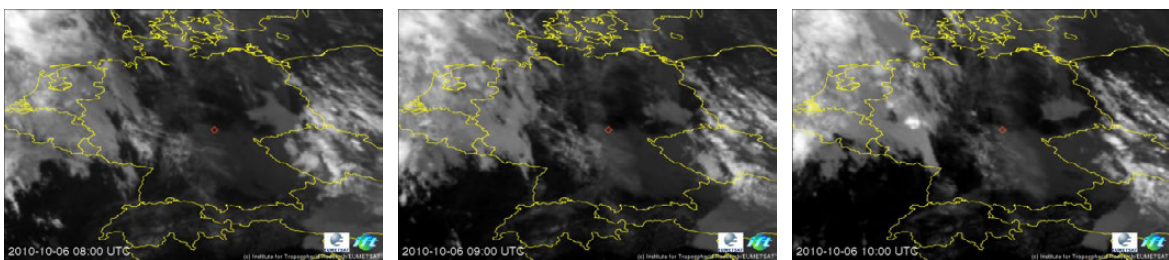


Fig. I 4 IR-satellite picture on 06-10-2010, 08, 09 and 10 UTC (source: ©TROPOS/EUMETSAT).

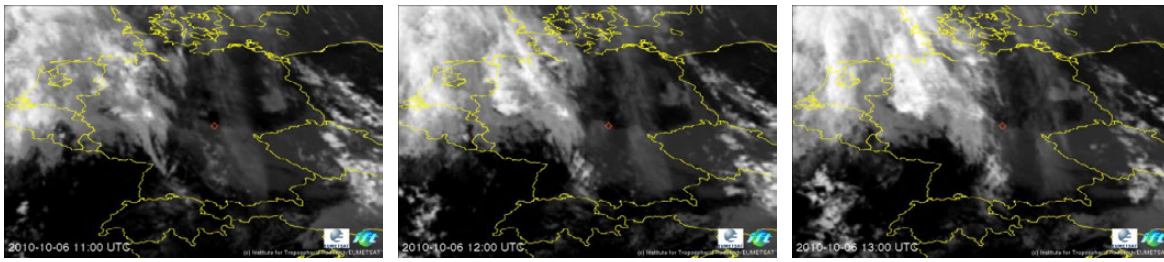


Fig. I 5 IR-satellite picture on 06-10-2010, 11, 12 and 13 UTC (source: ©TROPOMOS/EUMETSAT).

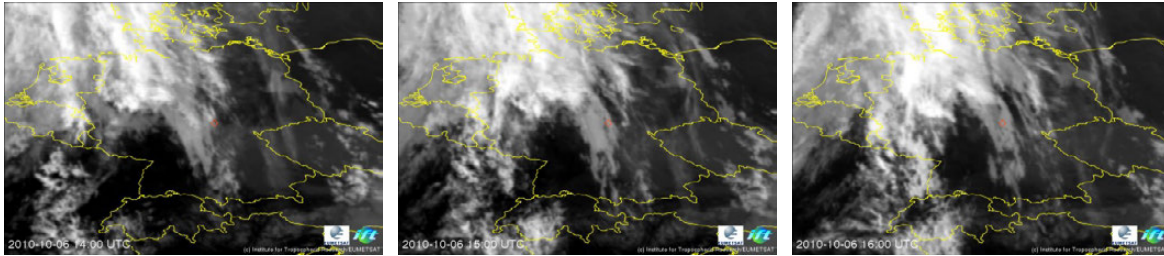


Fig. I 6 IR-satellite picture on 06-10-2010, 14, 15 and 16 UTC (source: ©TROPOMOS/EUMETSAT).

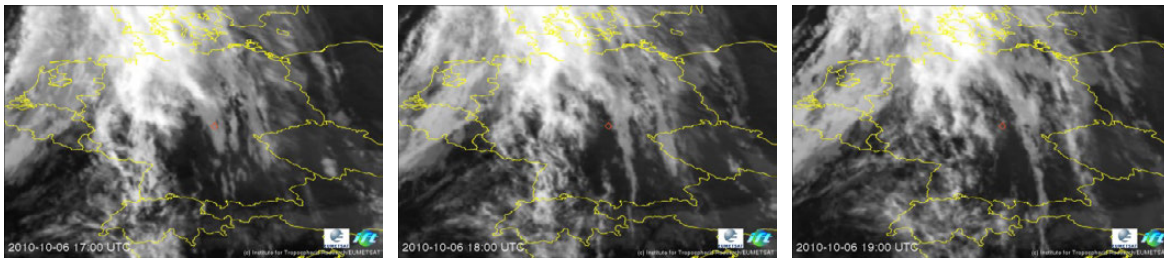


Fig. I 7 IR-satellite picture on 06-10-2010, 17, 18 and 19 UTC (source: ©TROPOMOS/EUMETSAT).

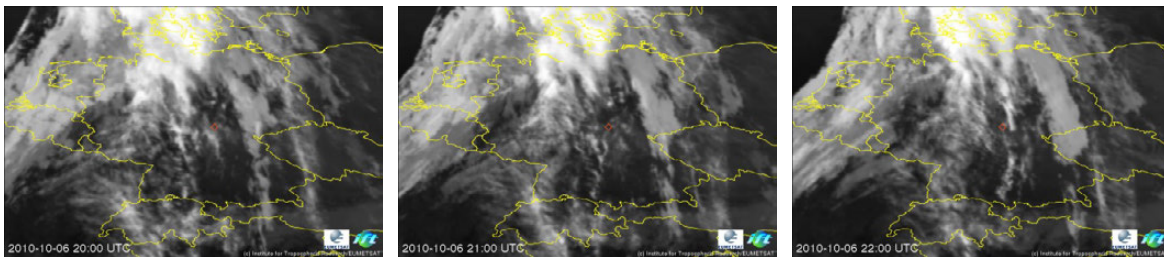


Fig. I 8 IR-satellite picture on 06-10-2010, 20, 21 and 22 UTC (source: ©TROPOMOS/EUMETSAT).



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

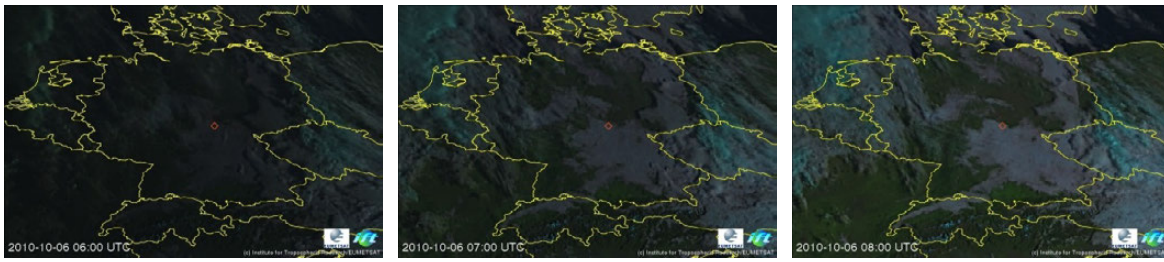


Fig. I 10 VIS-satellite picture on 06-10-2010, 06, 07 and 08 UTC (source: ©TROPOS/EUMETSAT).

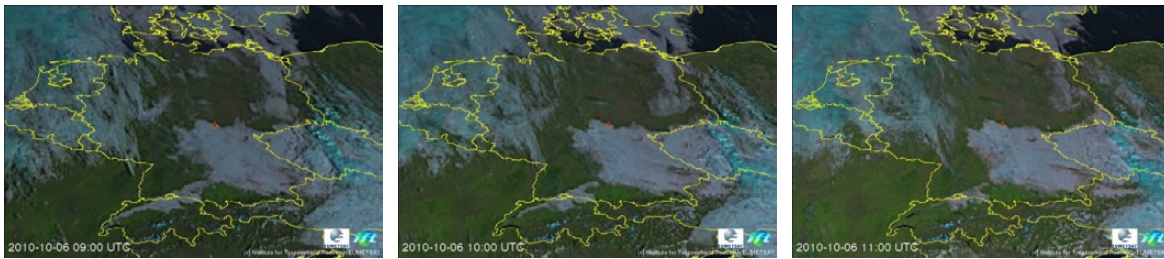


Fig. I 11 VIS-satellite picture on 06-10-2010, 09, 10 and 11 UTC (source: ©TROPOS/EUMETSAT).



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

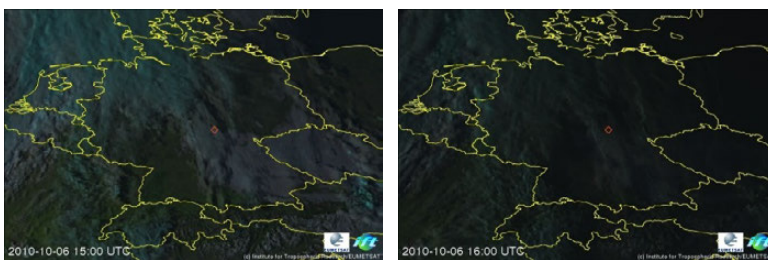
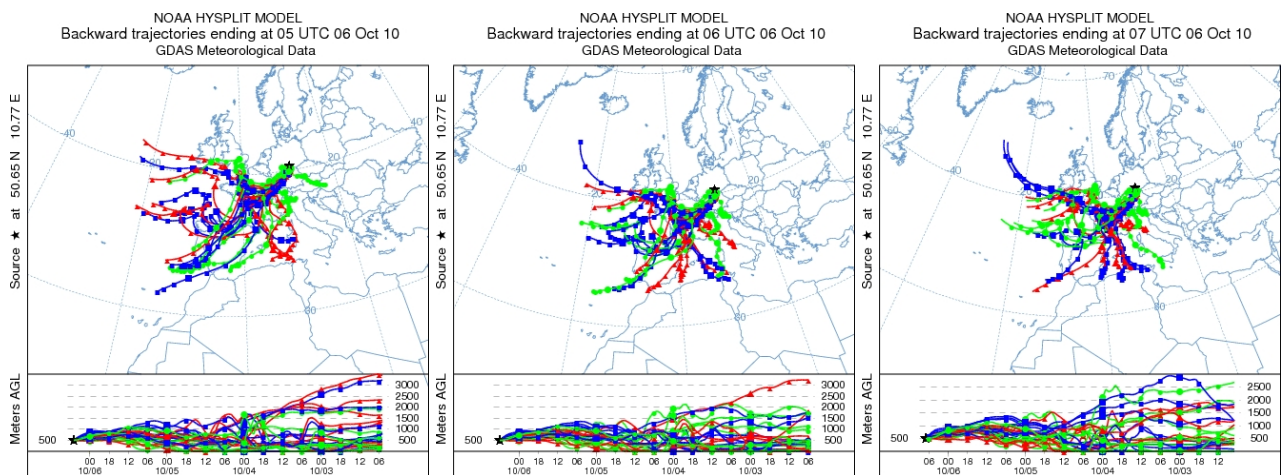
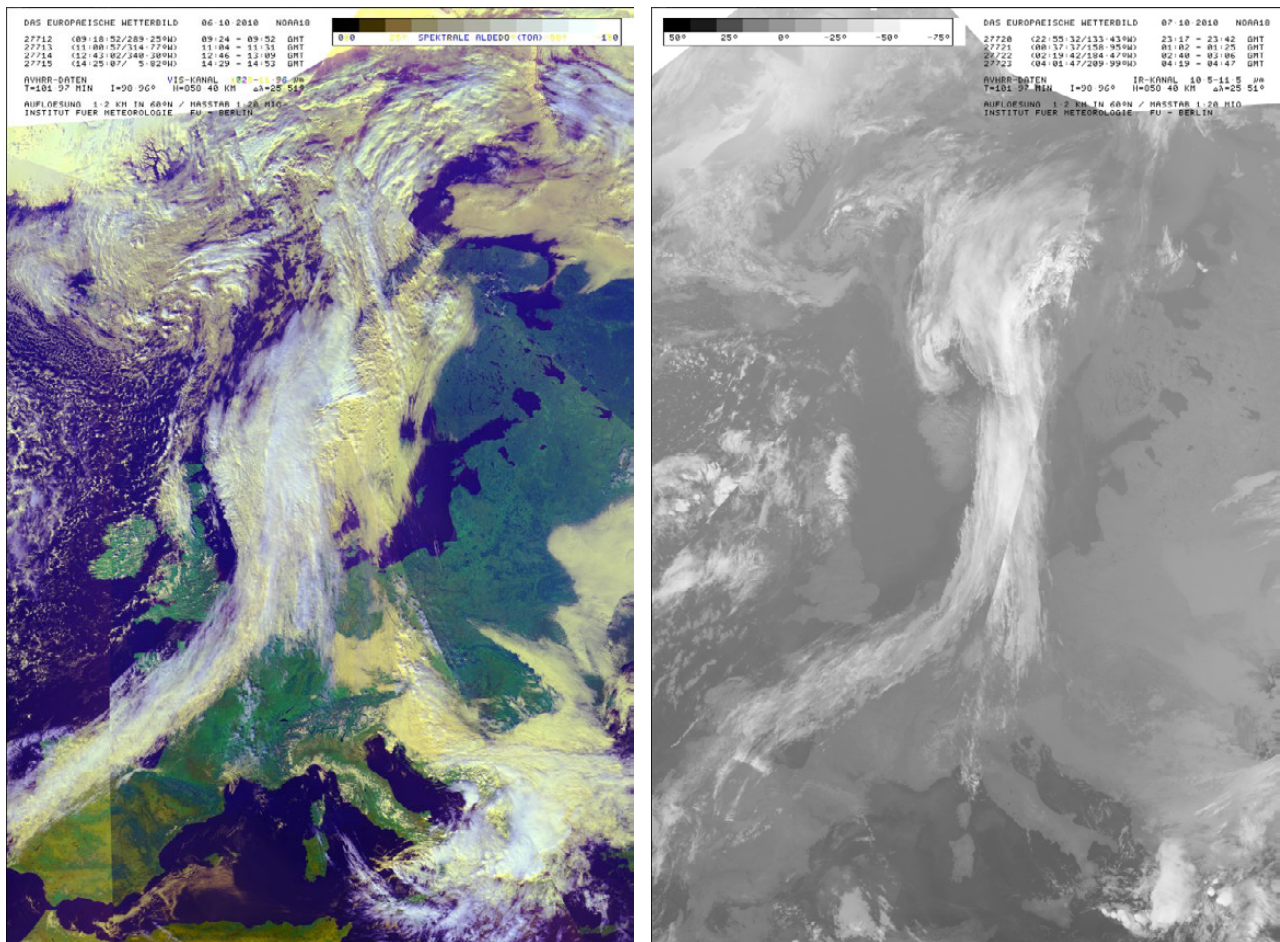


Fig. I 13 VIS-satellite picture on 06-10-2010, 15 and 16 UTC (source: ©TROPOS/EUMETSAT).



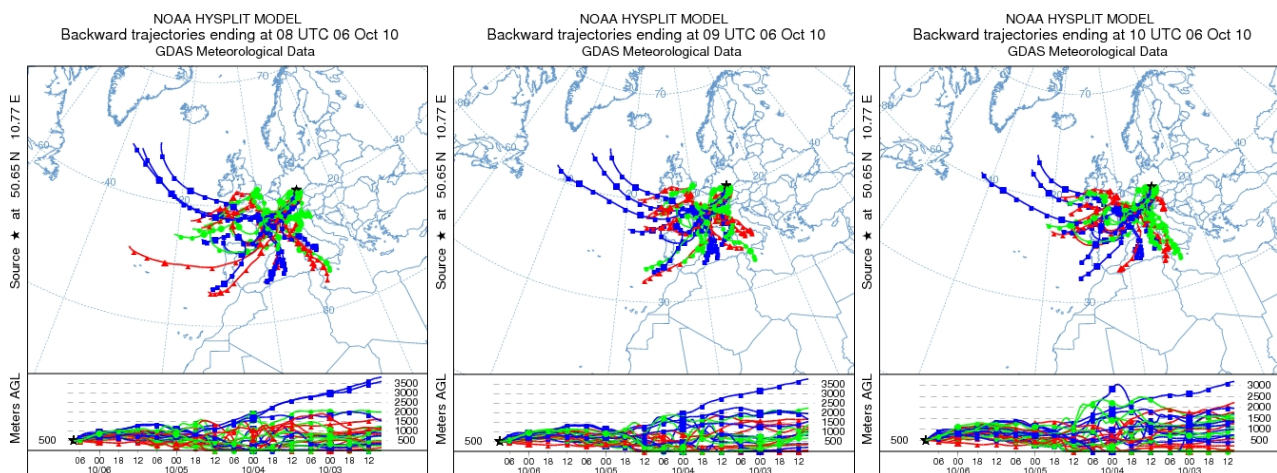


Fig. I 16 Backward trajectories on 06-10-2010, 08, 09 and 10 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

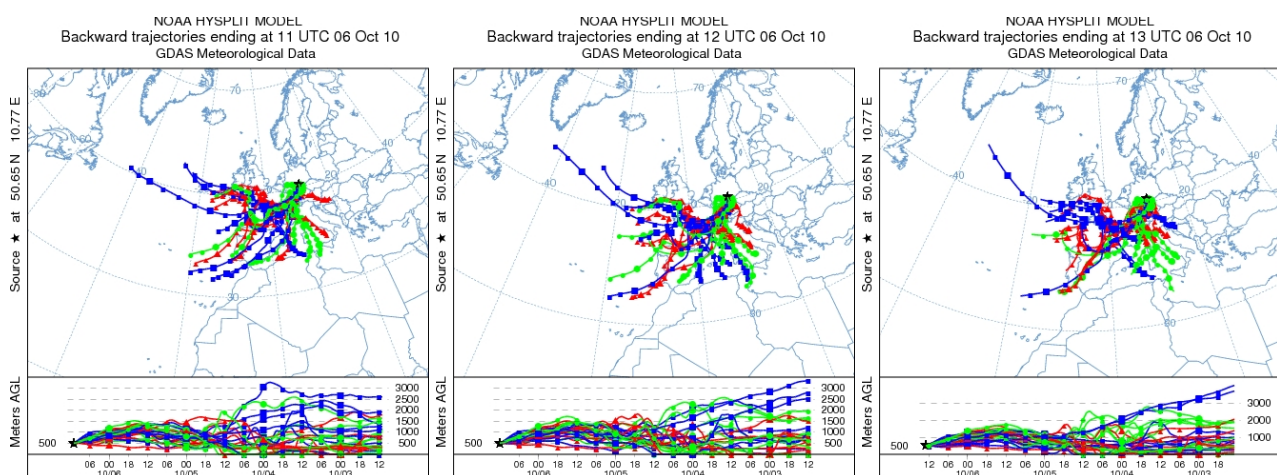


Fig. I 17 Backward trajectories on 06-10-2010, 11, 12 and 13 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

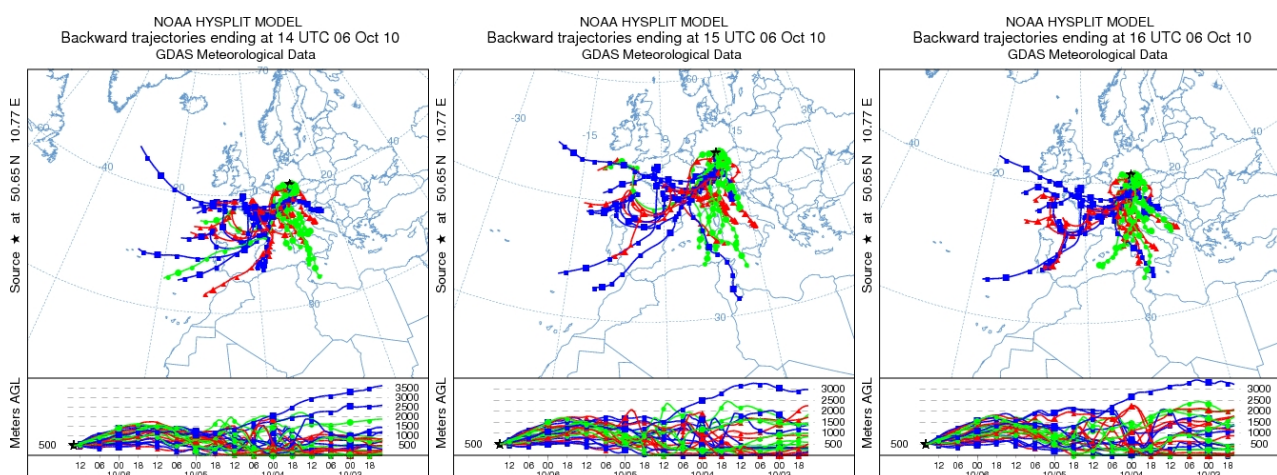


Fig. I 18 Backward trajectories on 06-10-2010, 14, 15 and 16 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

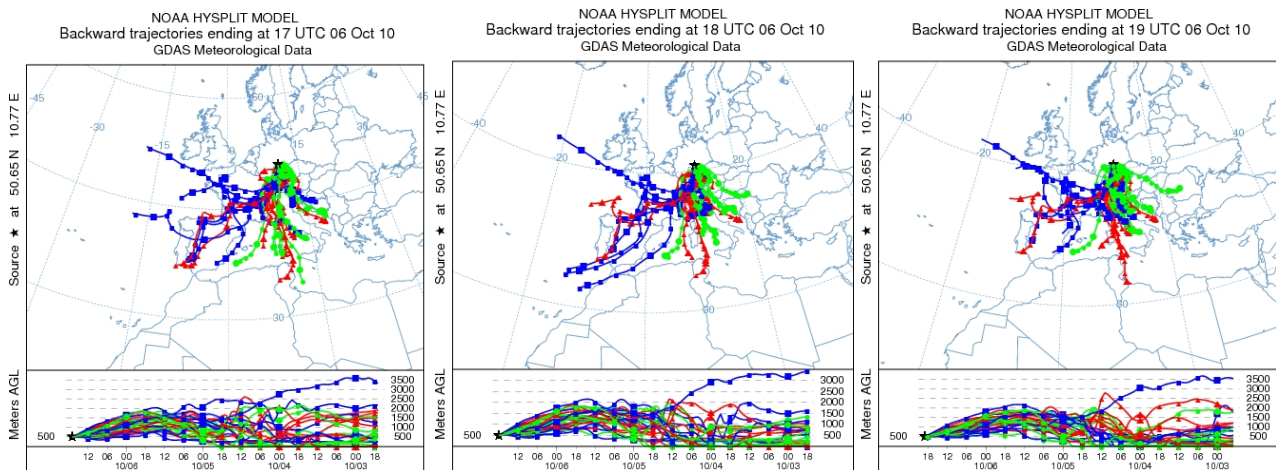


Fig. I 19 Backward trajectories on 06-10-2010, 17, 18 and 19 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

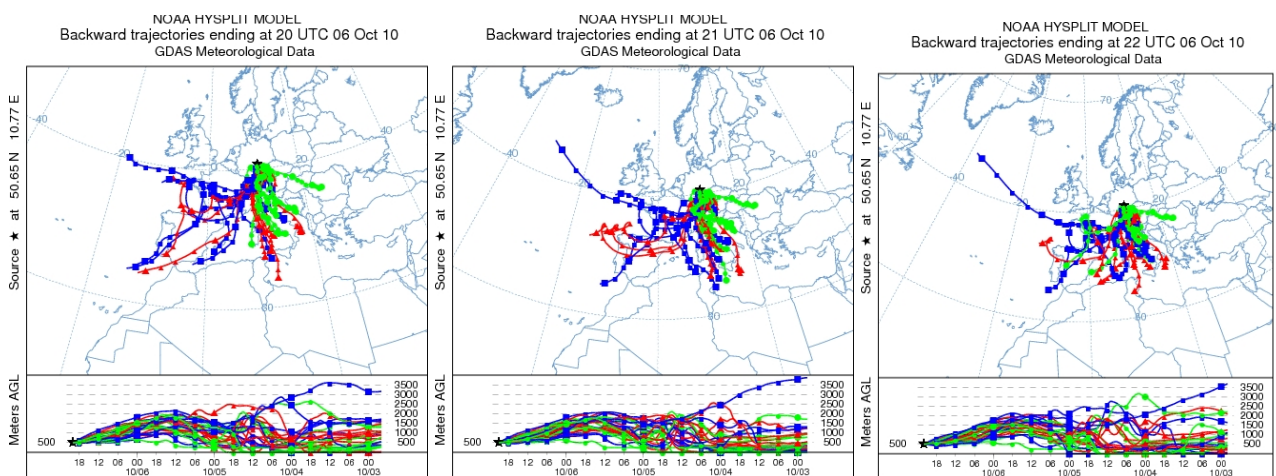


Fig. I 20 Backward trajectories on 06-10-2010, 20, 21 and 22 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

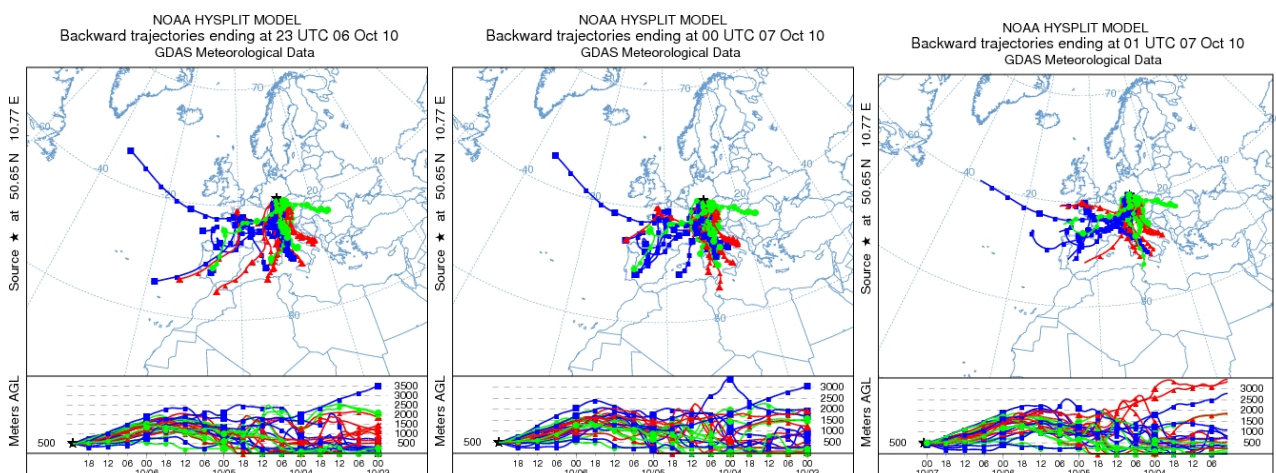


Fig. I 21 Backward trajectories on 06-10-2010, 23, and 07-10-2010, 00 and 01 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

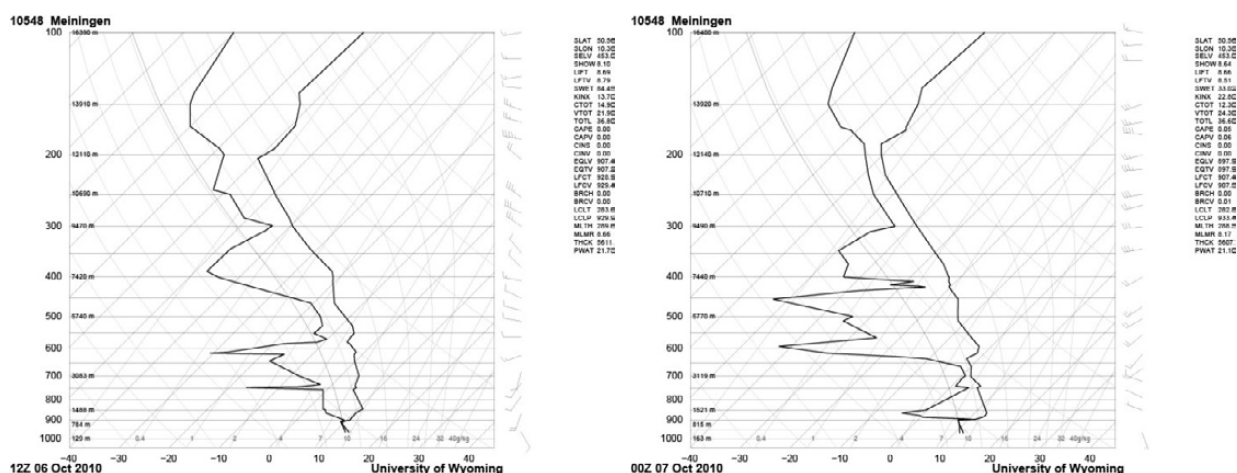


Table I 1 Locally measured meteorological data at the summit station Schmücke on 06/07-10-2010.

time [CEST]	temperature [°C]	air pressure [hPa]	precipitation [mm]	wind speed [m s ⁻¹]	wind direction [°]
06-10-2010 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

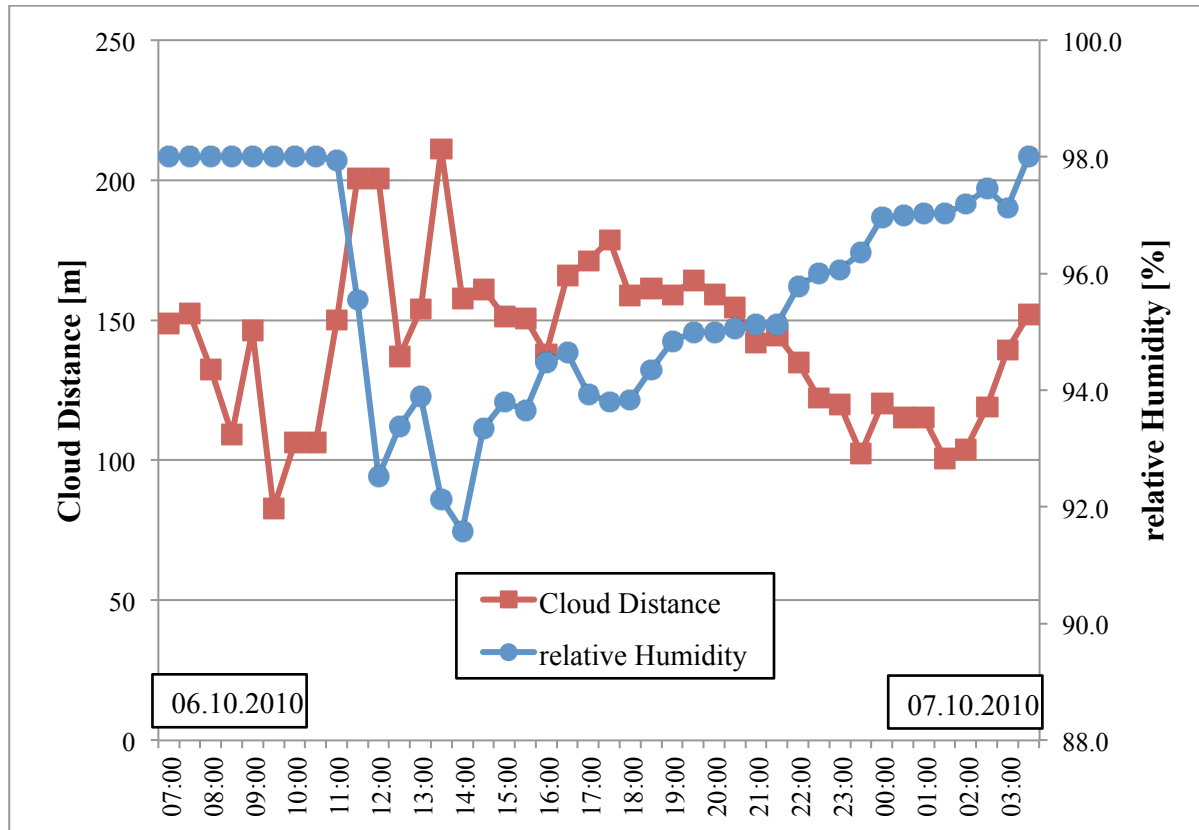


Fig. I 23 Cloud height and relative humidity on cloud event FCE13.3.

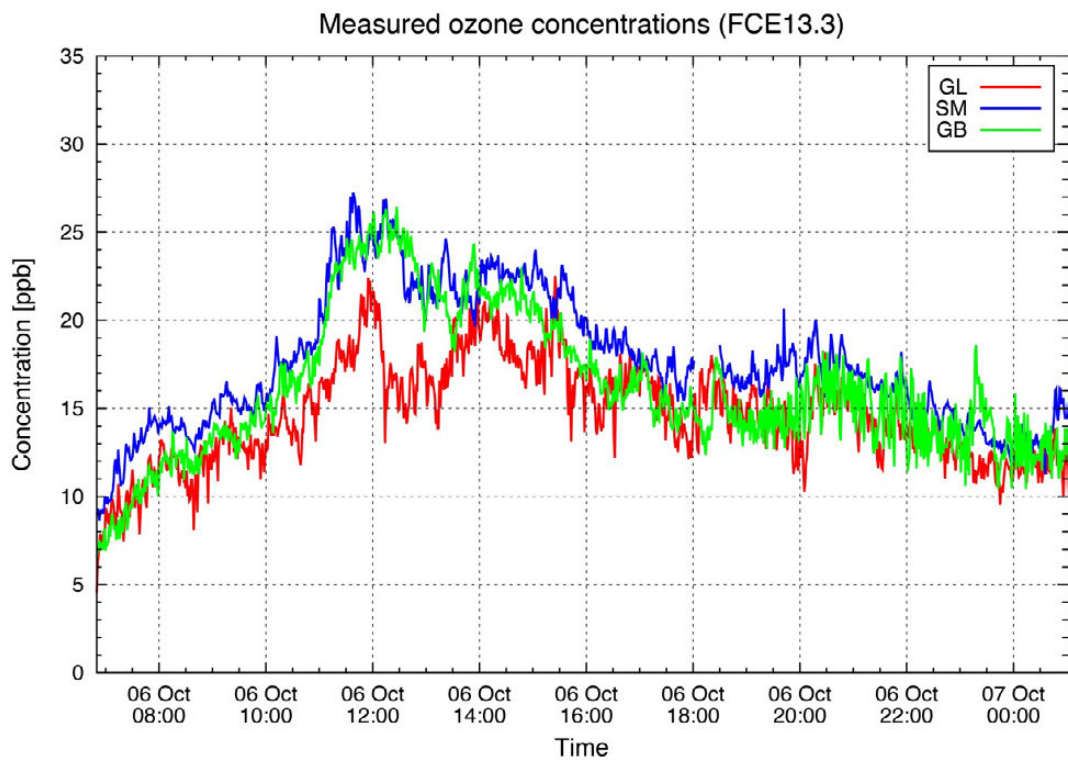


Fig. I 24 Measured ozone concentration over the full event.

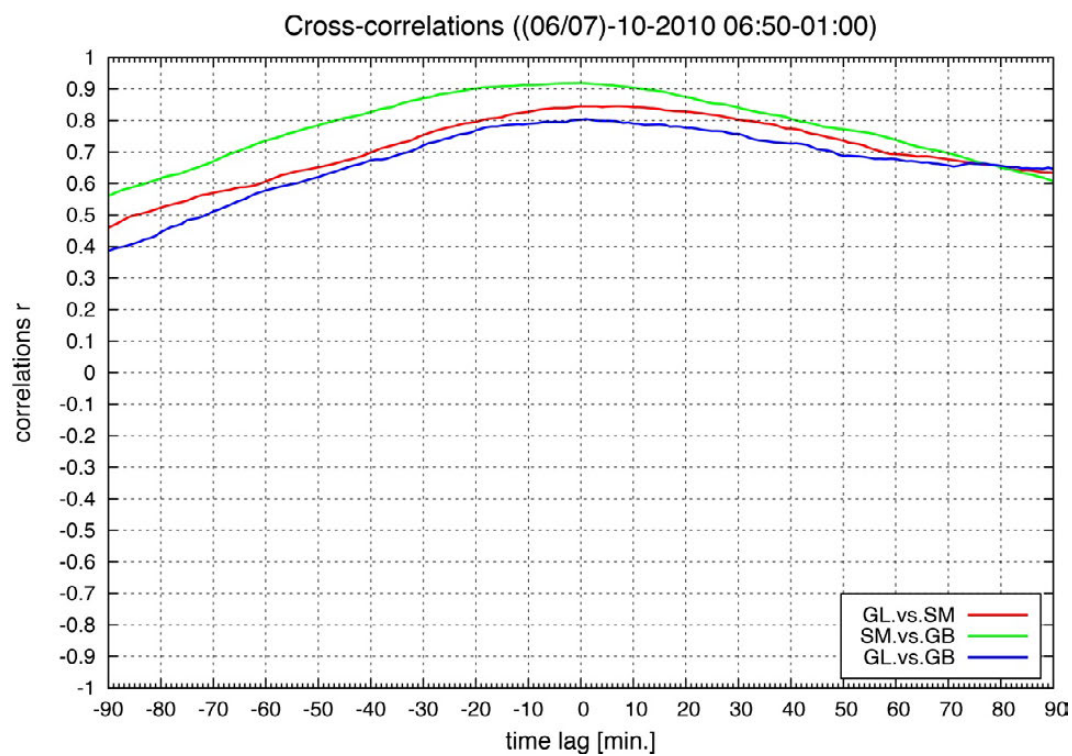


Fig. I 25 Cross-correlation of the full event.

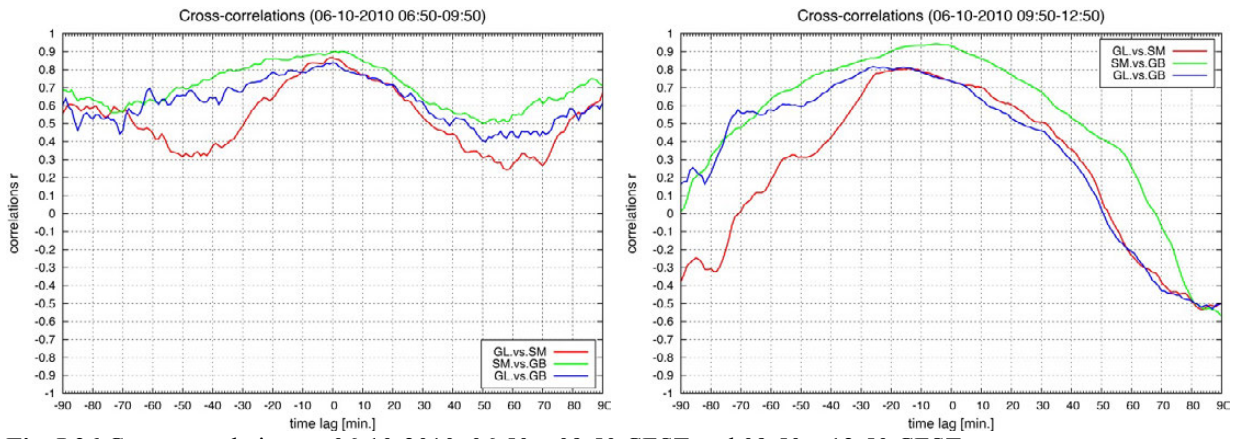


Fig. I 26 Cross-correlation on 06-10-2010, 06:50 – 09:50 CEST and 09:50 – 12:50 CEST.

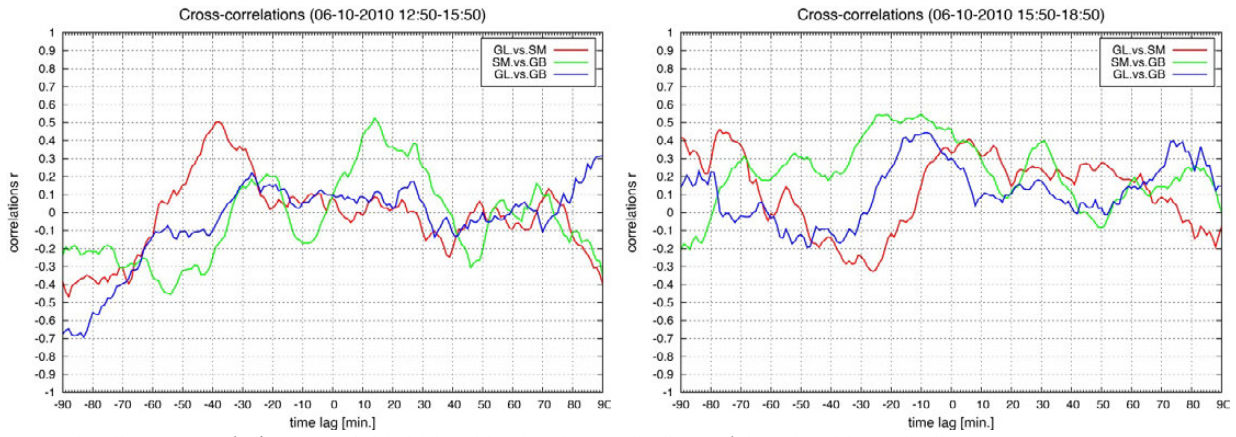


Fig. I 27 Cross-correlation on 06-10-2010, 12:50 – 15:50 CEST and 15:50 – 18:50 CEST.

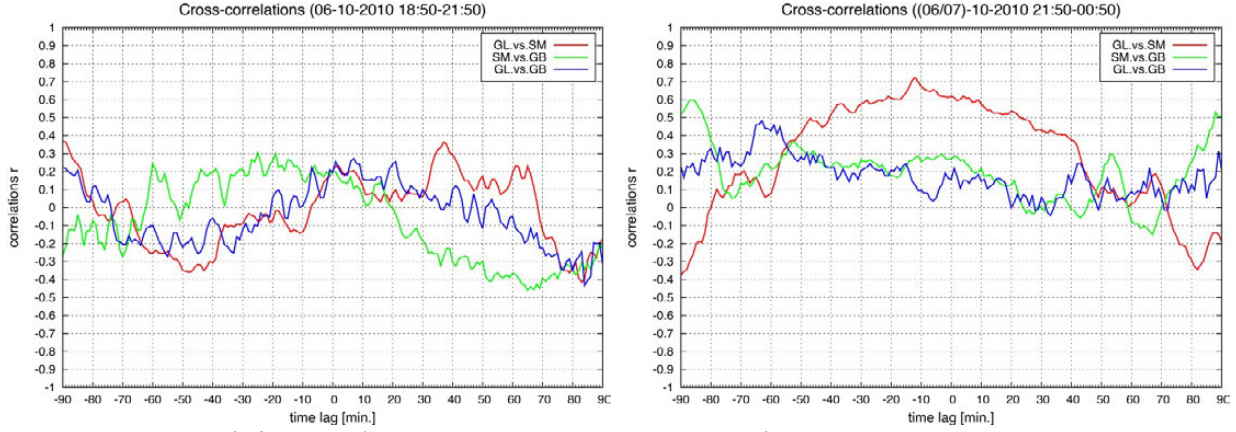


Fig. I 28 Cross-correlation on 06-10-2010, 18:50 – 21:50 CEST and 21:50 – 00:50 CEST.

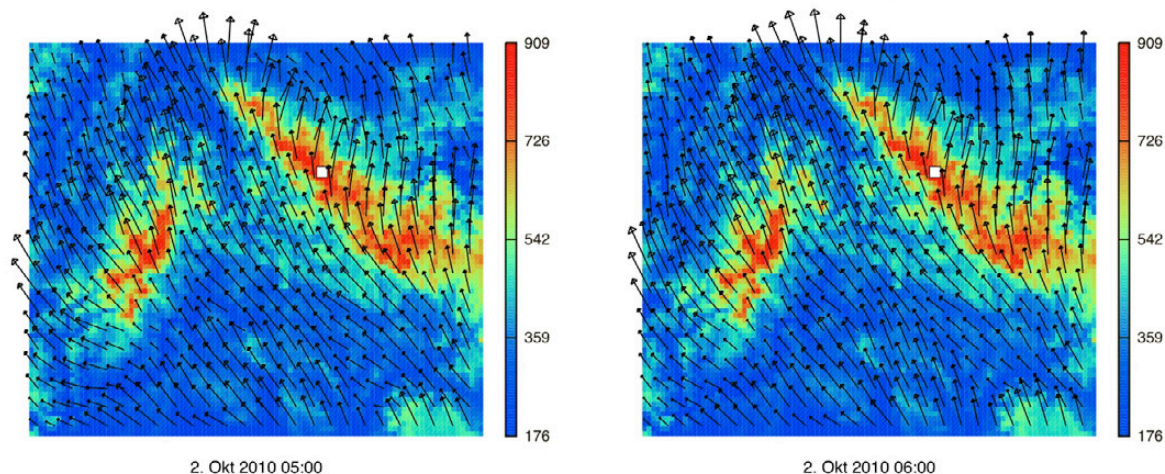


Fig. I 29 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

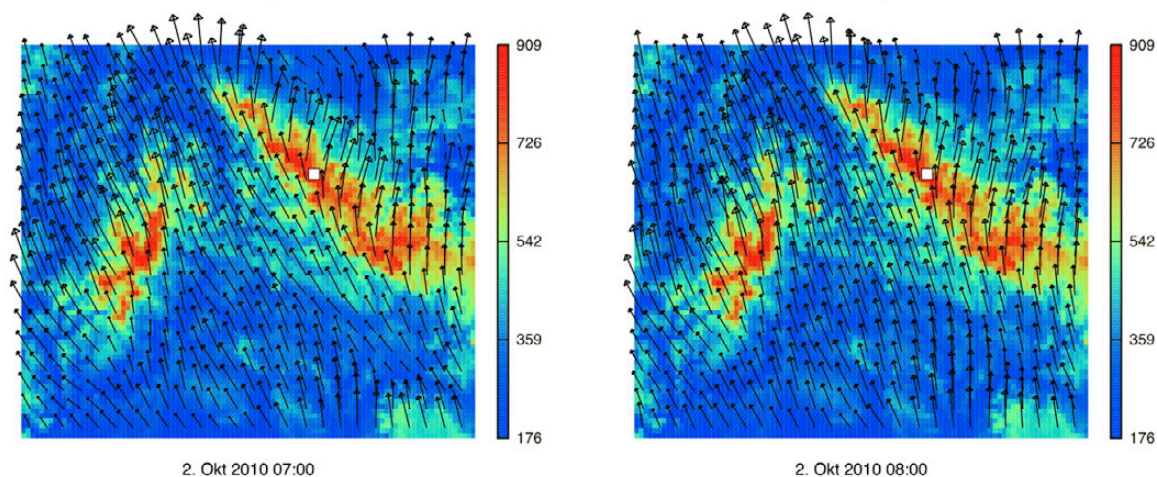


Fig. I 30 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

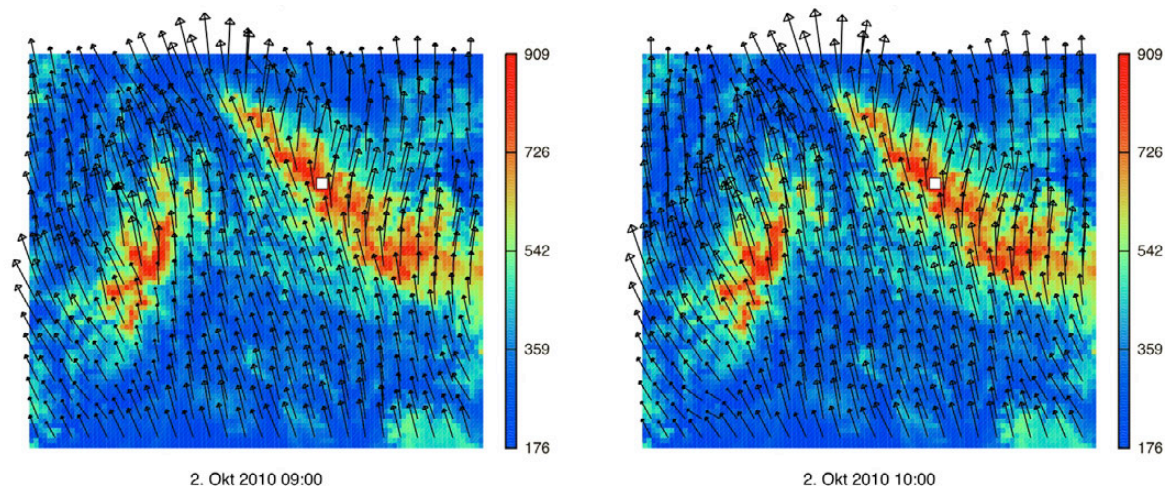


Fig. I 31 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

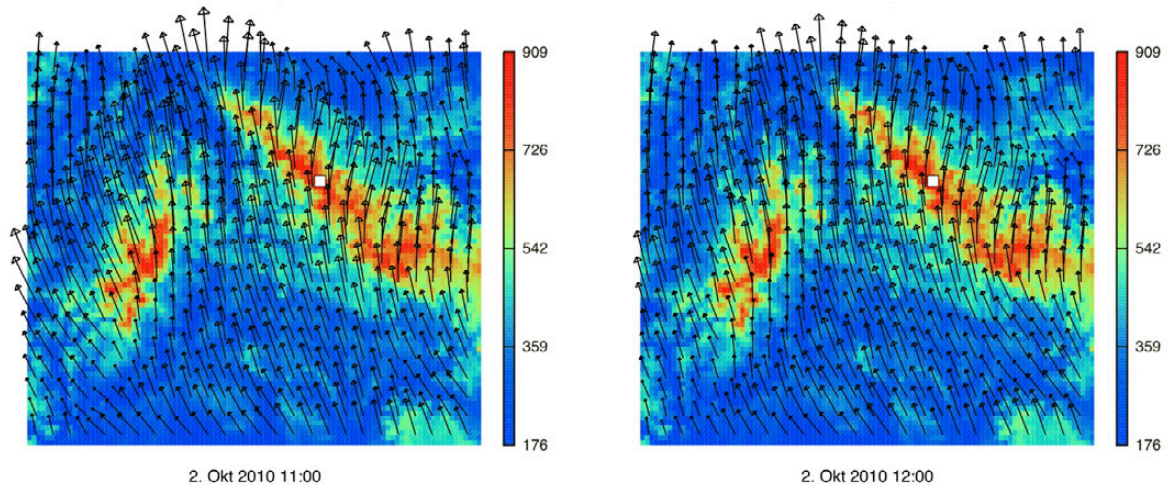


Fig. I 32 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

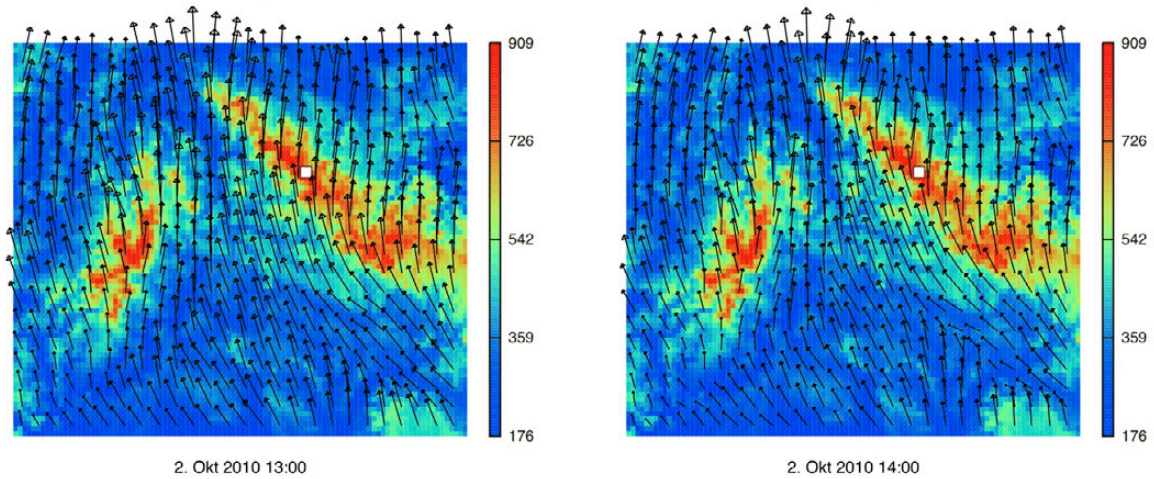


Fig. I 33 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

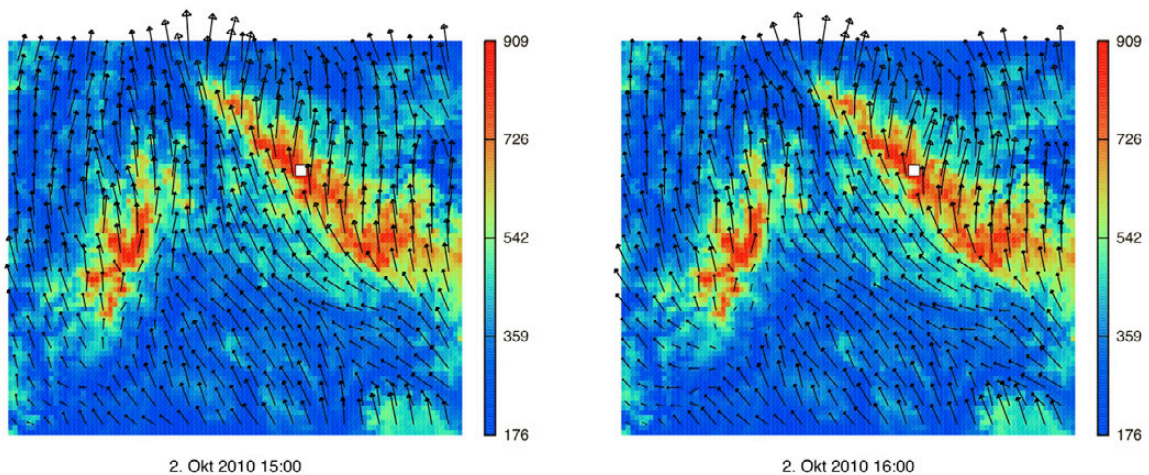


Fig. I 34 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

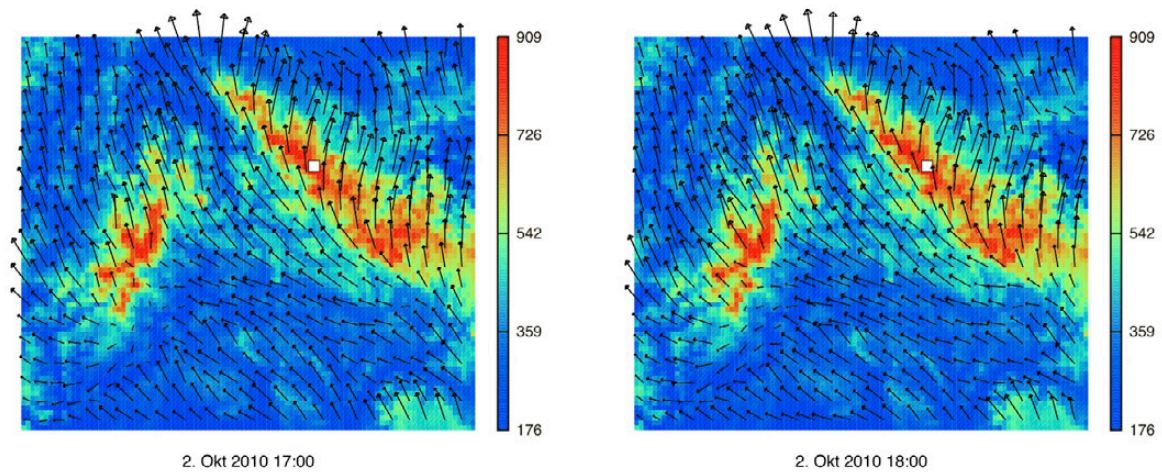


Fig. I 35 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

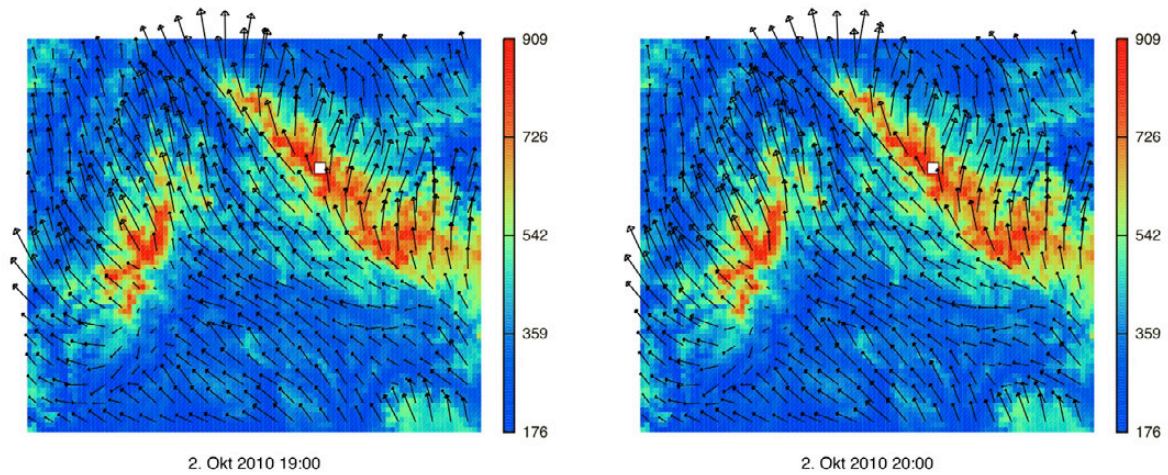


Fig. I 36 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

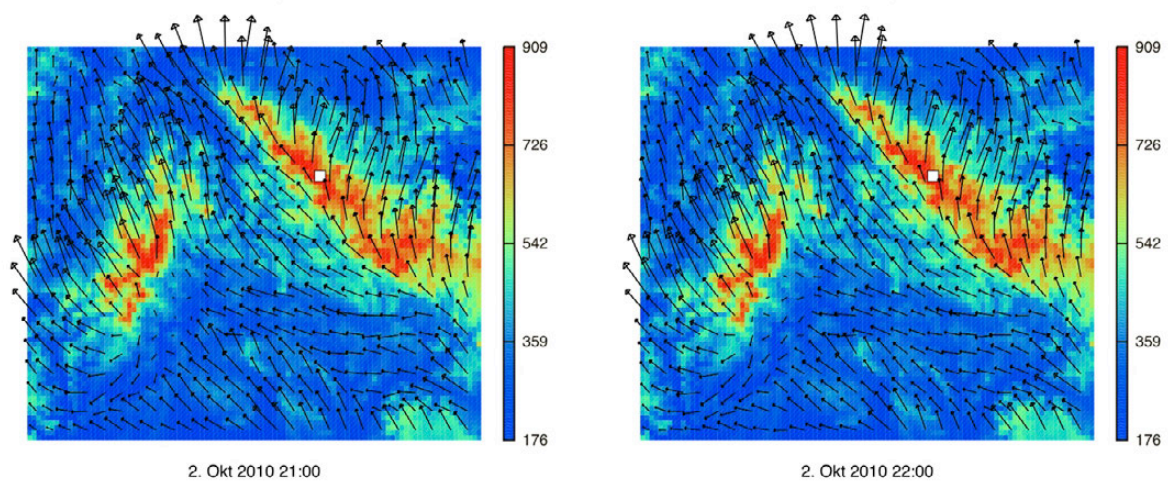


Fig. I 37 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

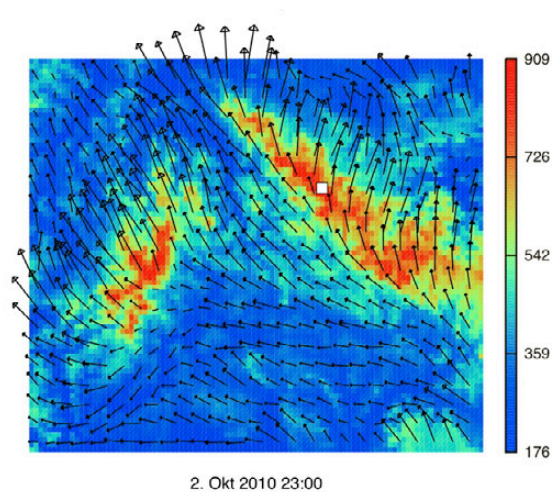


Fig. I 38 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

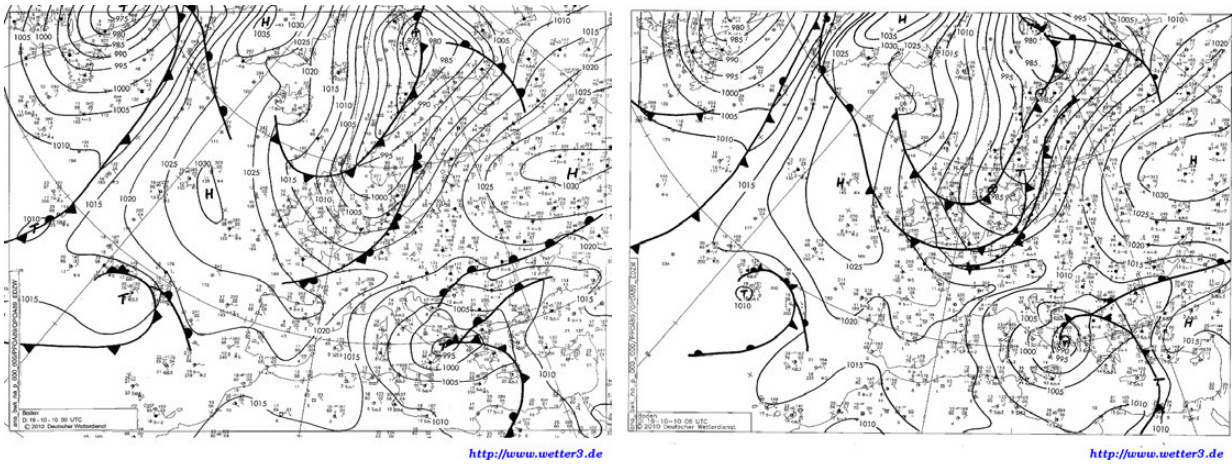


Fig. J 1 Surface weather charts on 19-10-2010, 00 and 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

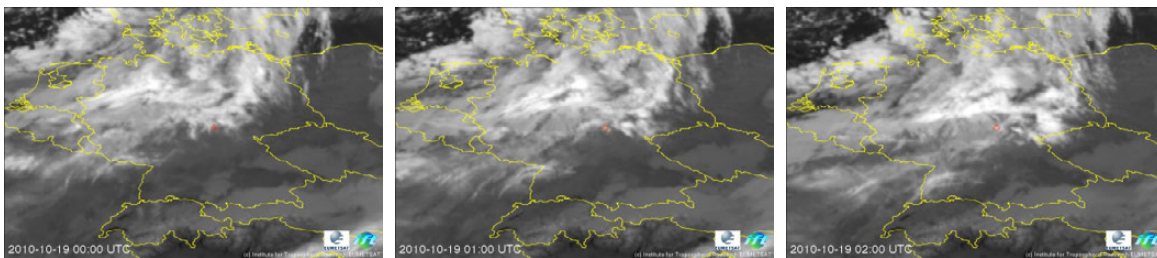


Fig. J 2 IR-satellite picture on 19-10-2010, 00, 01 and 02 UTC (source: ©TROPOS/EUMETSAT).

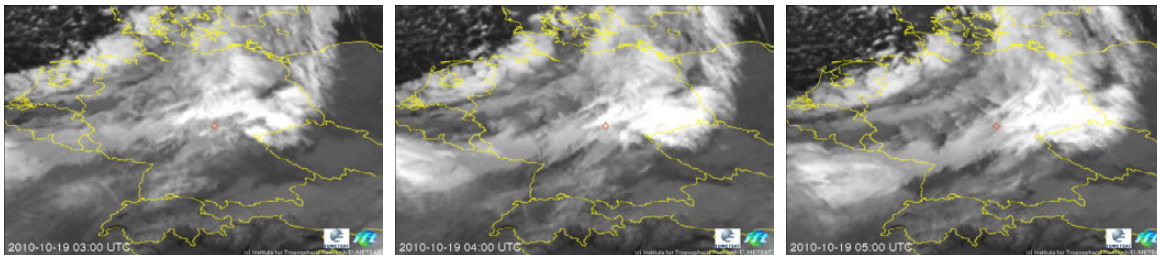


Fig. J 3 IR-satellite picture on 19-10-2010, 03, 04 and 05 UTC (source: ©TROPOS/EUMETSAT).

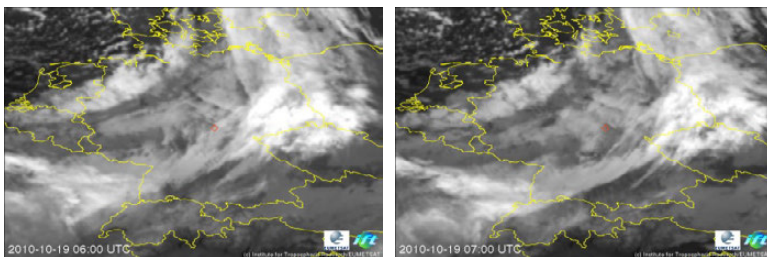


Fig. J 4 IR-satellite picture on 19-10-2010, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

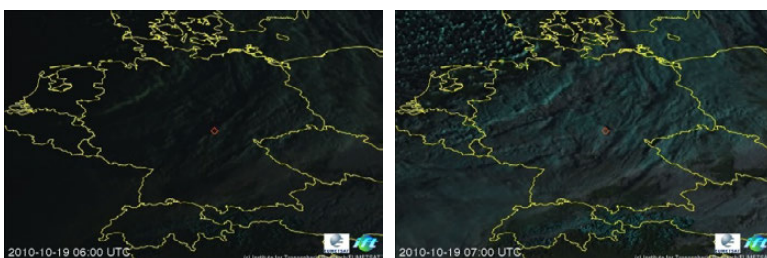


Fig. J 5 VIS-satellite picture on 19-10-2010, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

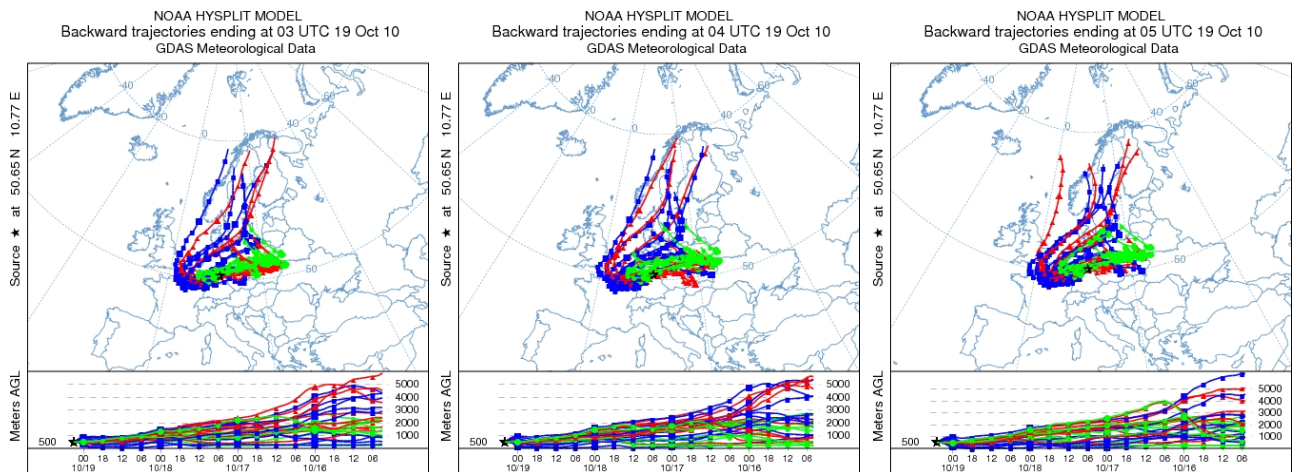


Fig. J 8 Backward trajectories on 19-10-2010, 03, 04 and 05 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

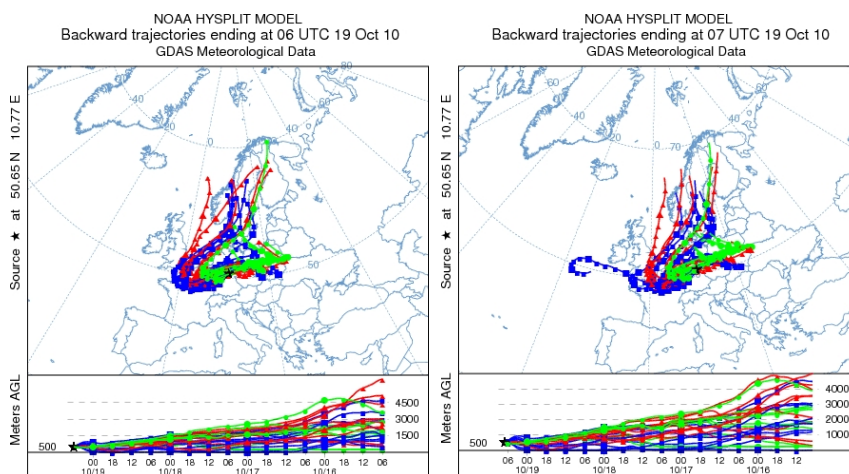


Fig. J 9 Backward trajectories on 19-10-2010, 06 and 07 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

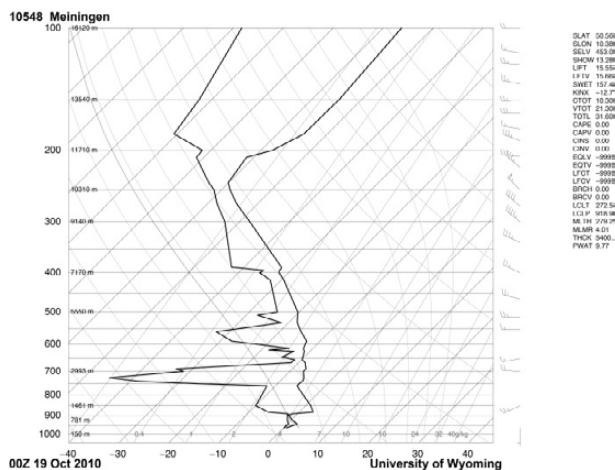


Fig. J 10 Vertical rawinsonde profiles of temperature and dew-point temperature on 19-10-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

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

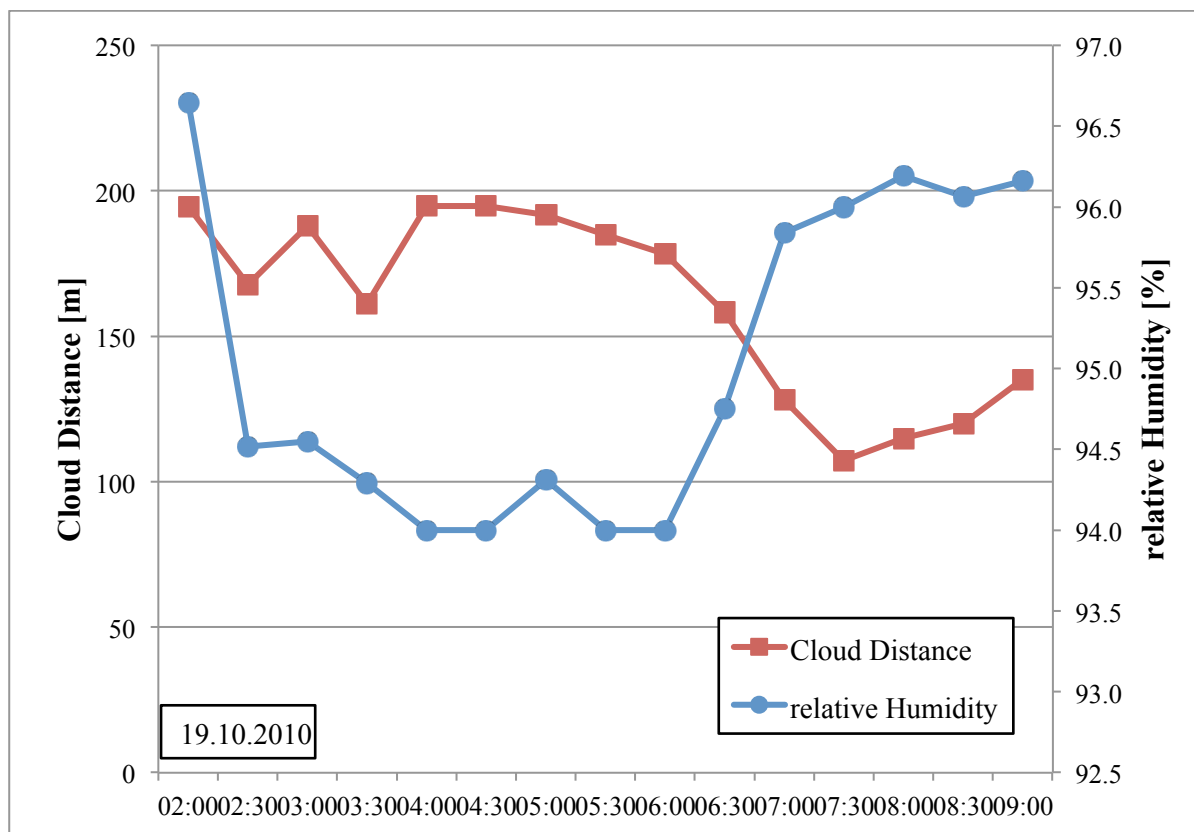


Fig. J 11 Cloud height and relative humidity on cloud event FCE22.0.

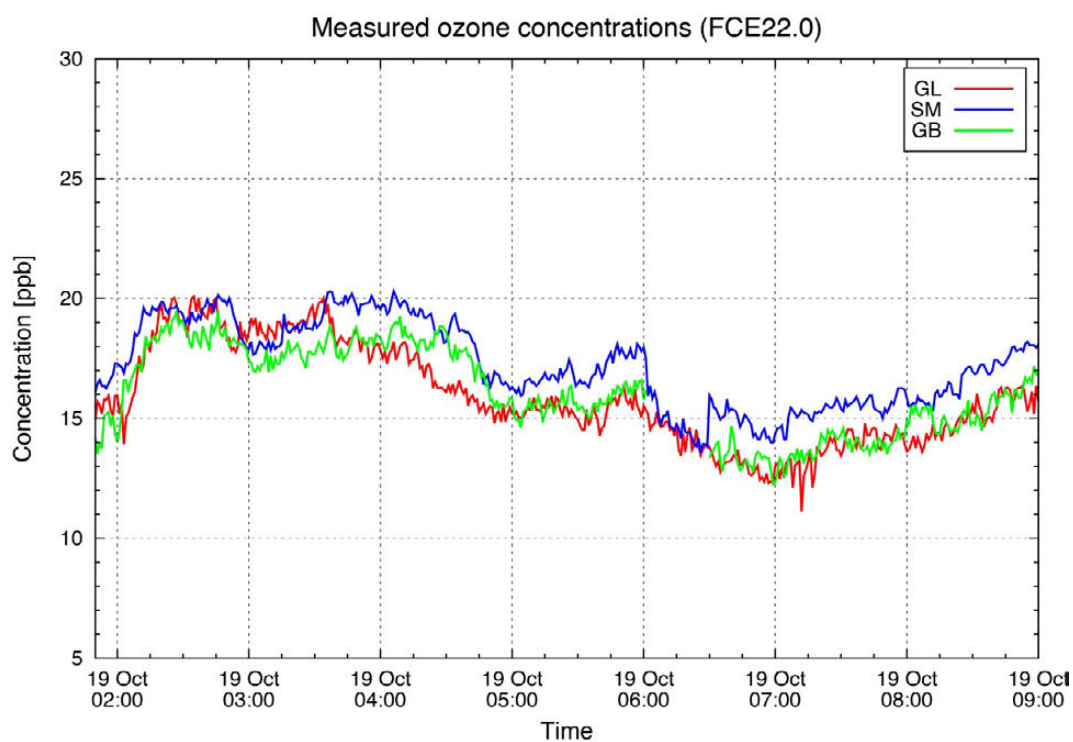


Fig. J 12 Measured ozone concentration over the full event.

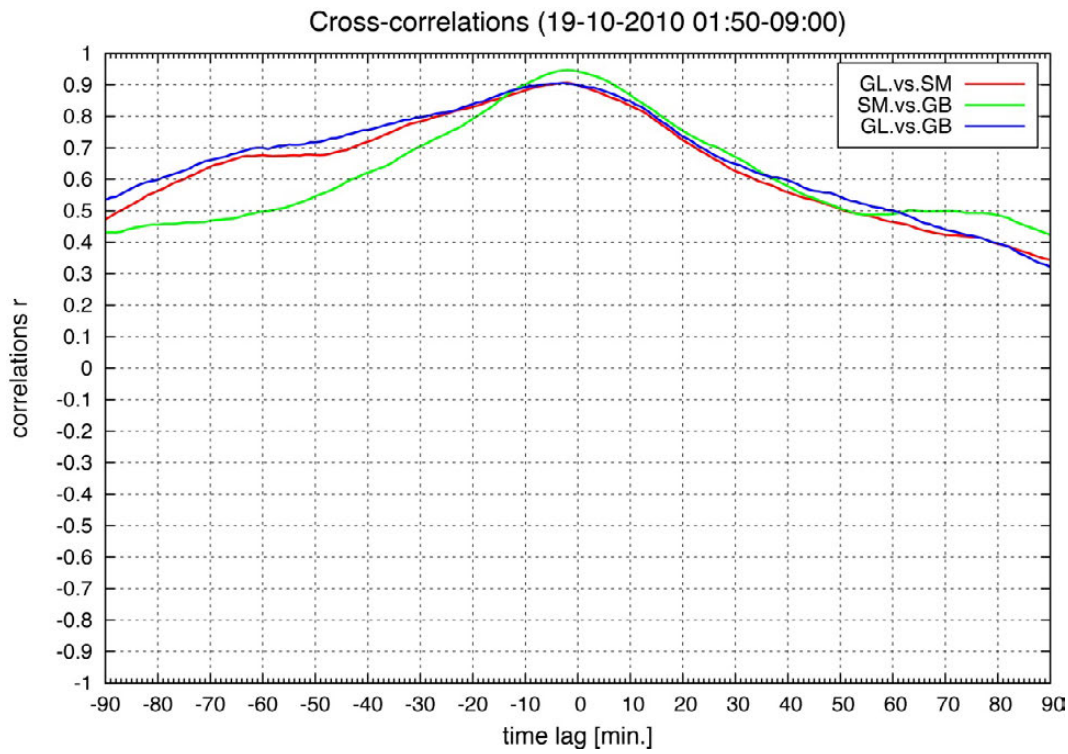


Fig. J 13 Cross-correlation of the full event.

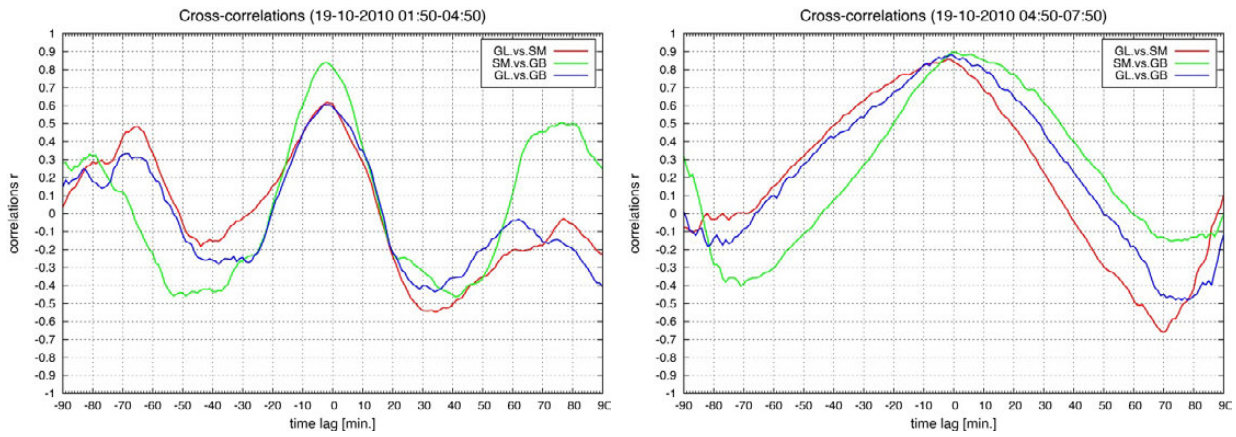


Fig. J 14 Cross-correlation on 19-10-2010, 01:50 – 04:50 CEST and 04:50 – 07:50 CEST.

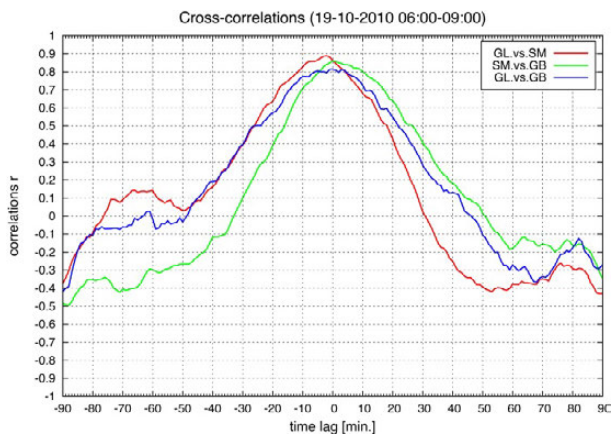


Fig. J 15 Cross-correlation on 06-10-2010, 06:00 – 09:00 CEST.

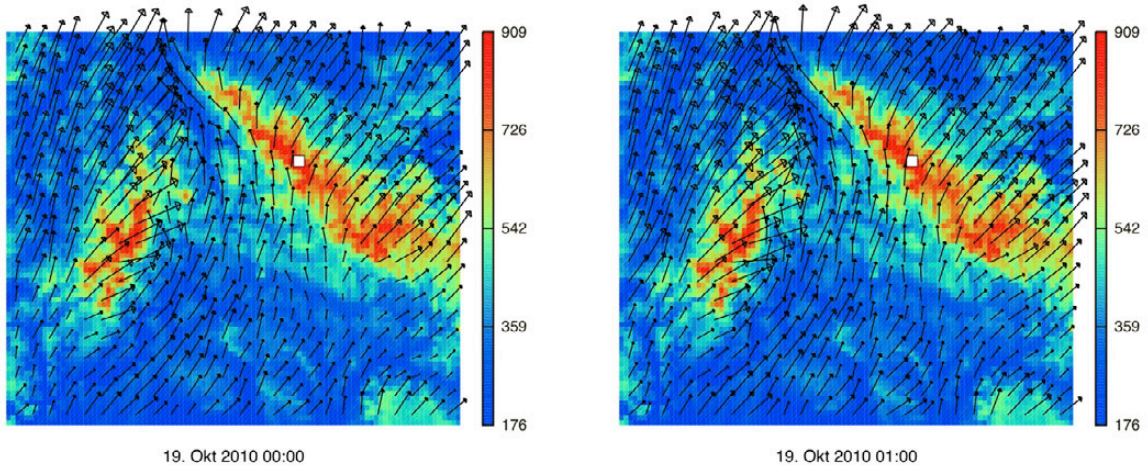


Fig. J 16 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

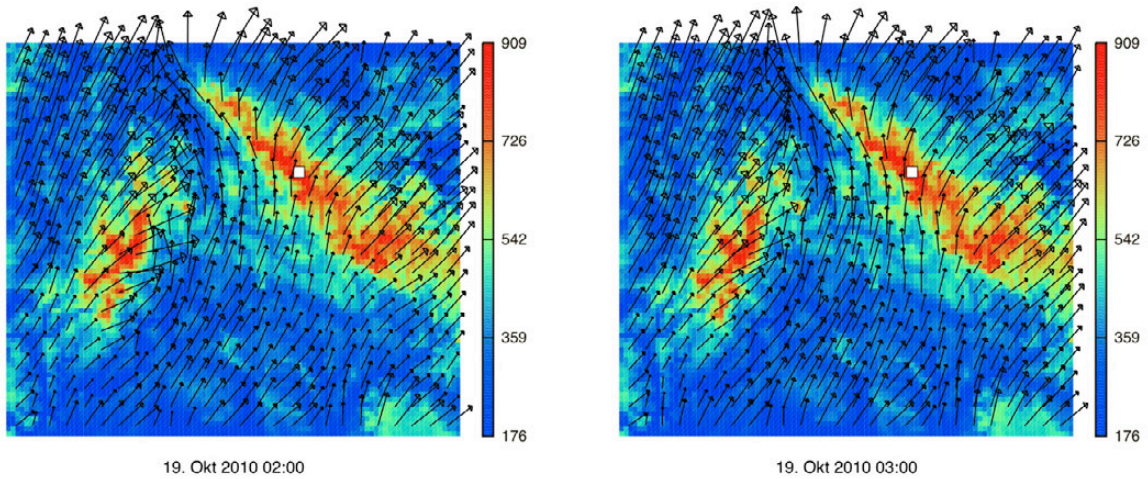


Fig. J 17 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

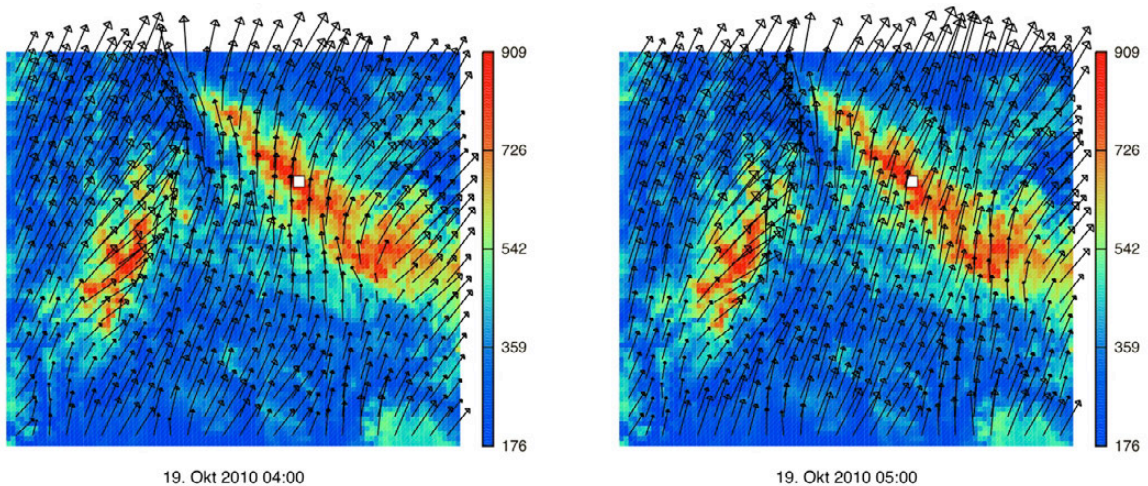


Fig. J 18 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

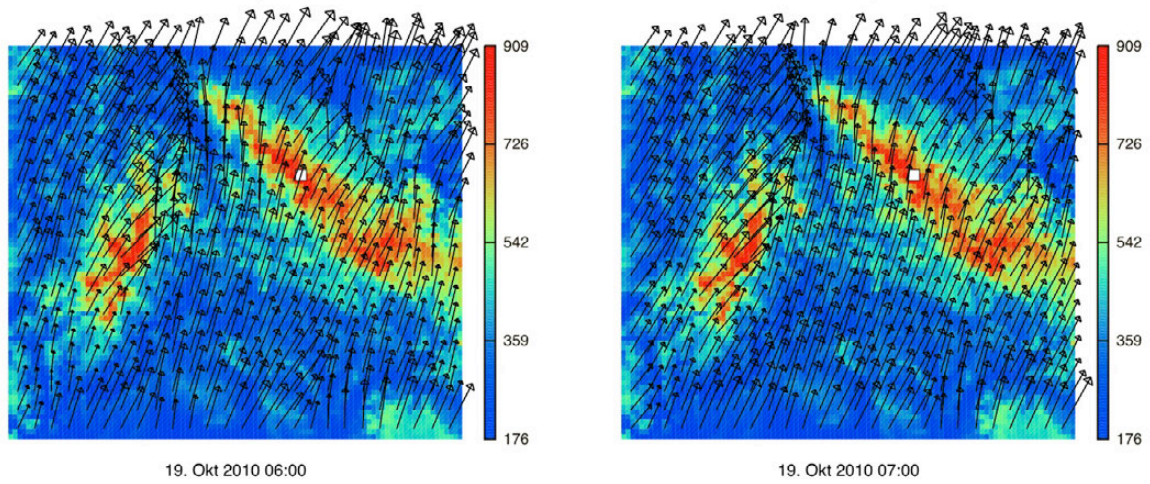


Fig. J 19 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

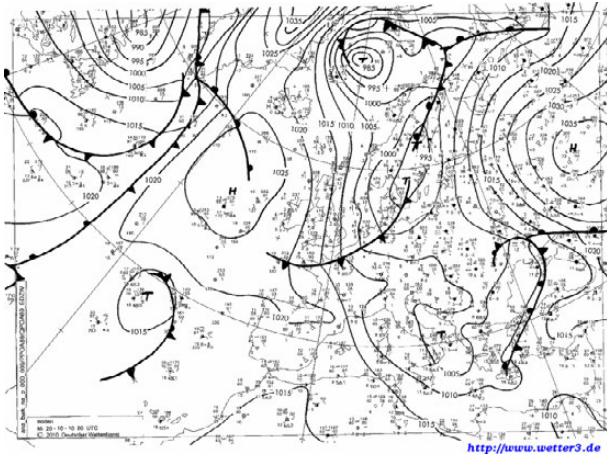


Fig. K 1 Surface weather charts on 20-10-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

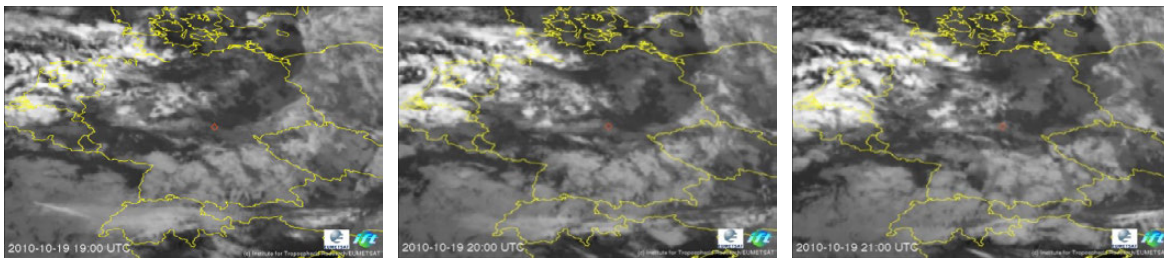


Fig. K 2 IR-satellite picture on 19-10-2010, 19, 20 and 21 UTC (source: ©TROPOS/EUMETSAT).

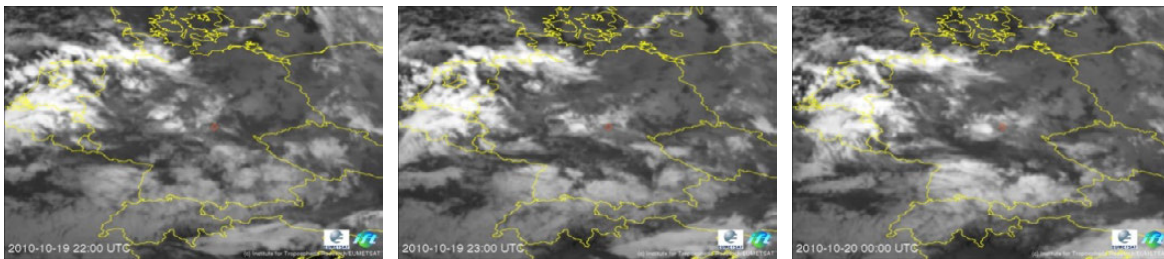


Fig. K 3 IR-satellite picture on 19-10-2010, 22 and 23 and 20 October, 00 UTC (source: ©TROPOS/EUMETSAT).

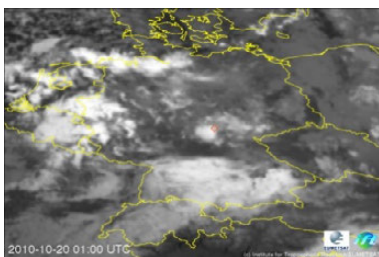


Fig. K 4 IR-satellite picture on 20-10-2010, 01 UTC (source: ©TROPOS/EUMETSAT).

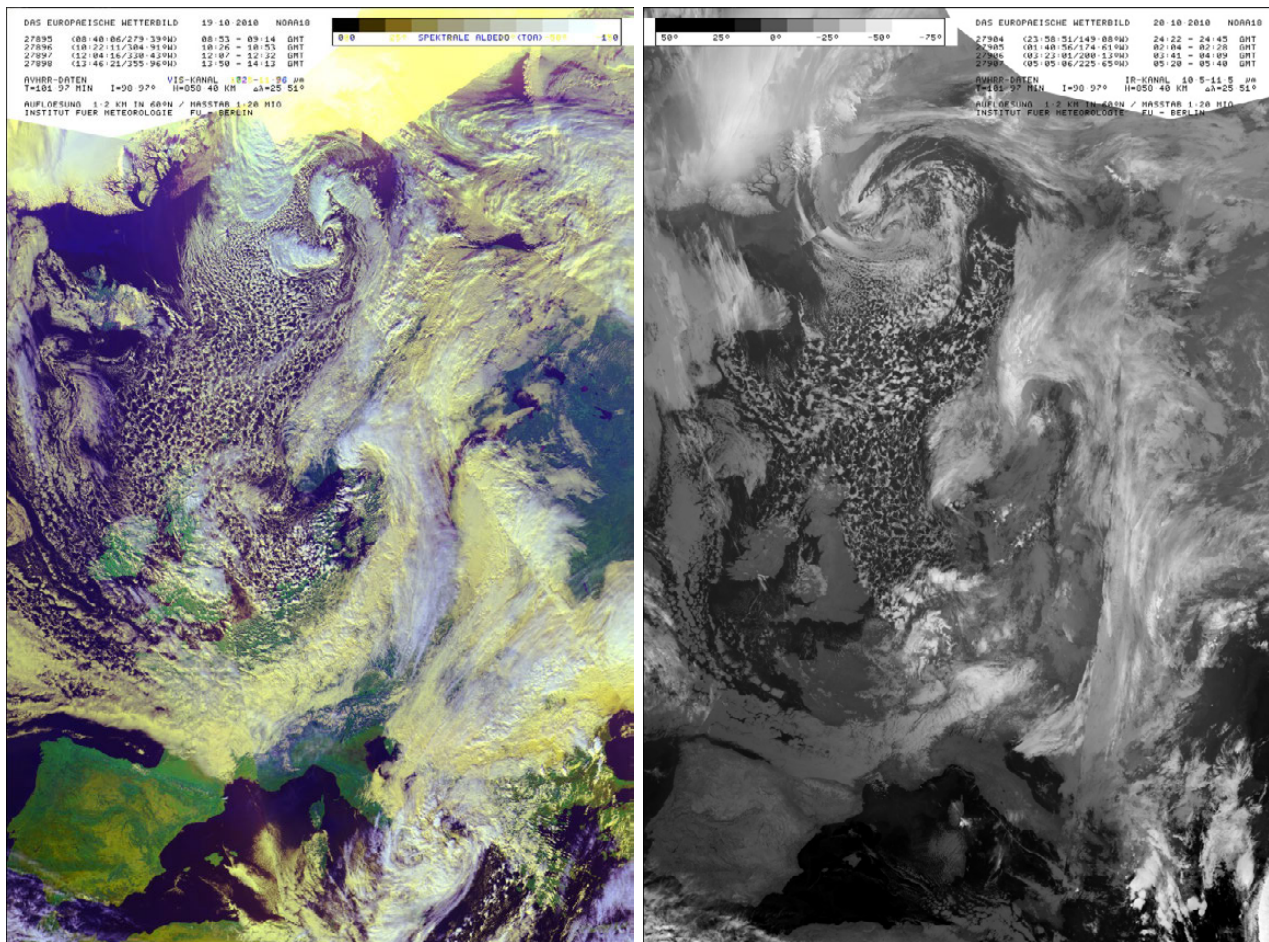


Fig. K 5 NOAA satellite pictures on 19-10-2010 and on 20-10-2010 (source: Berliner Wetterkarte e.V., 2010).

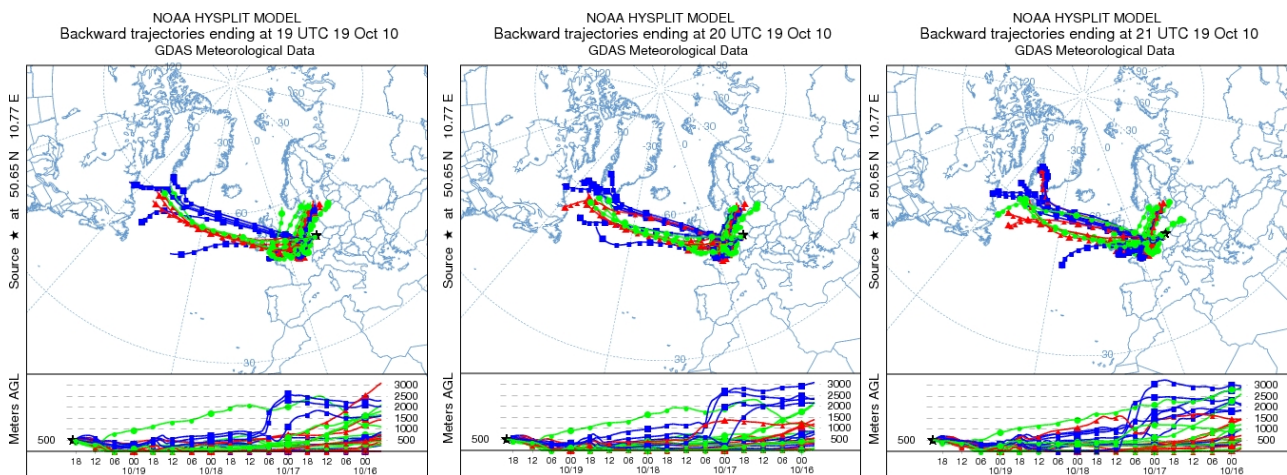


Fig. K 6 Backward trajectories on 19-10-2010, 19, 20 and 21 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

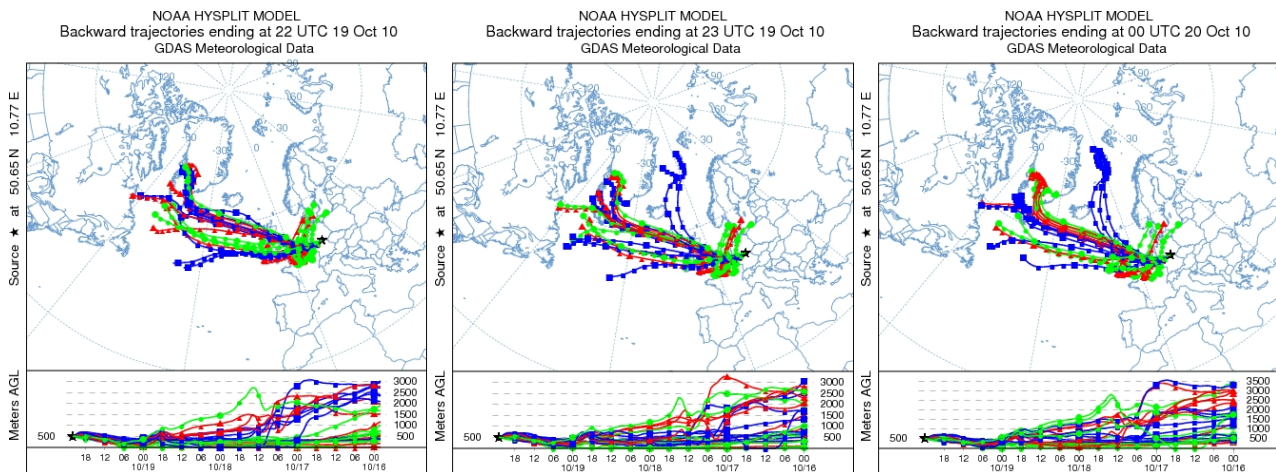


Fig. K 7 Backward trajectories on 19-10-2010, 22, 23 and 20-10-2010, 22 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

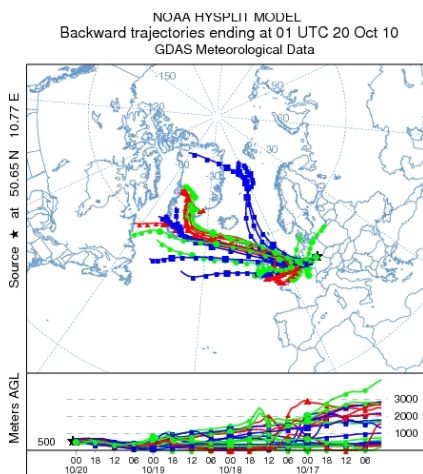


Fig. K 8 Backward trajectories on 20-10-2010, 01 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

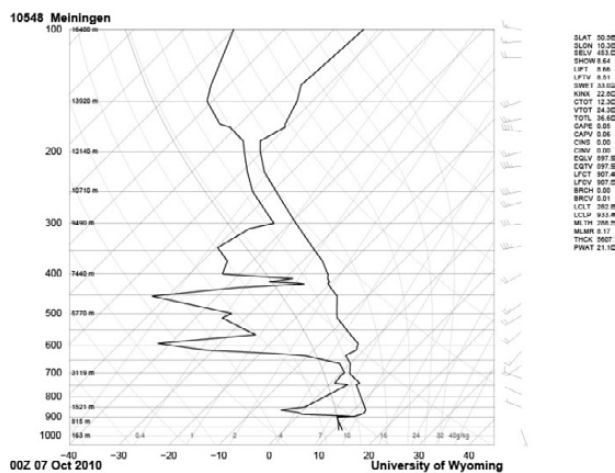


Fig. K 9 Vertical rawinsonde profiles of temperature and dew-point temperature on 20-10-2010, 00 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

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

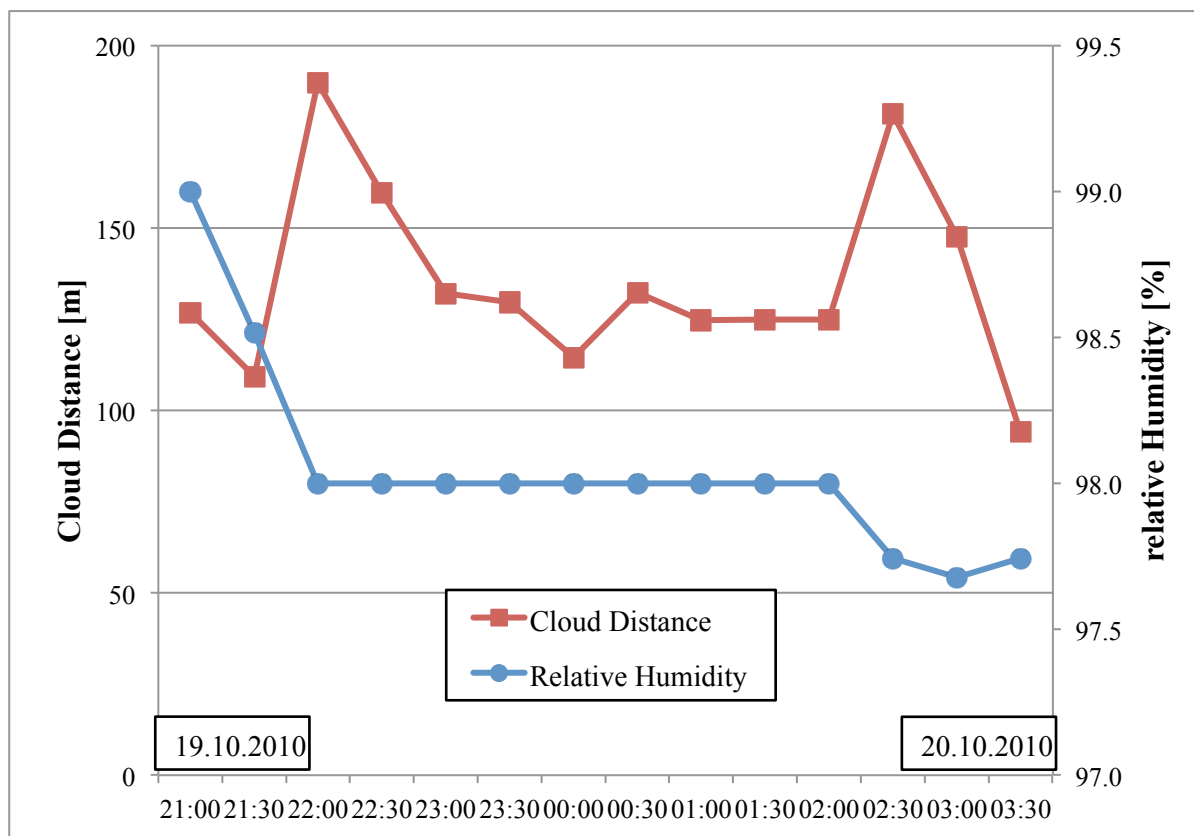


Fig. K 10 Cloud height and relative humidity on cloud event FCE22.1.

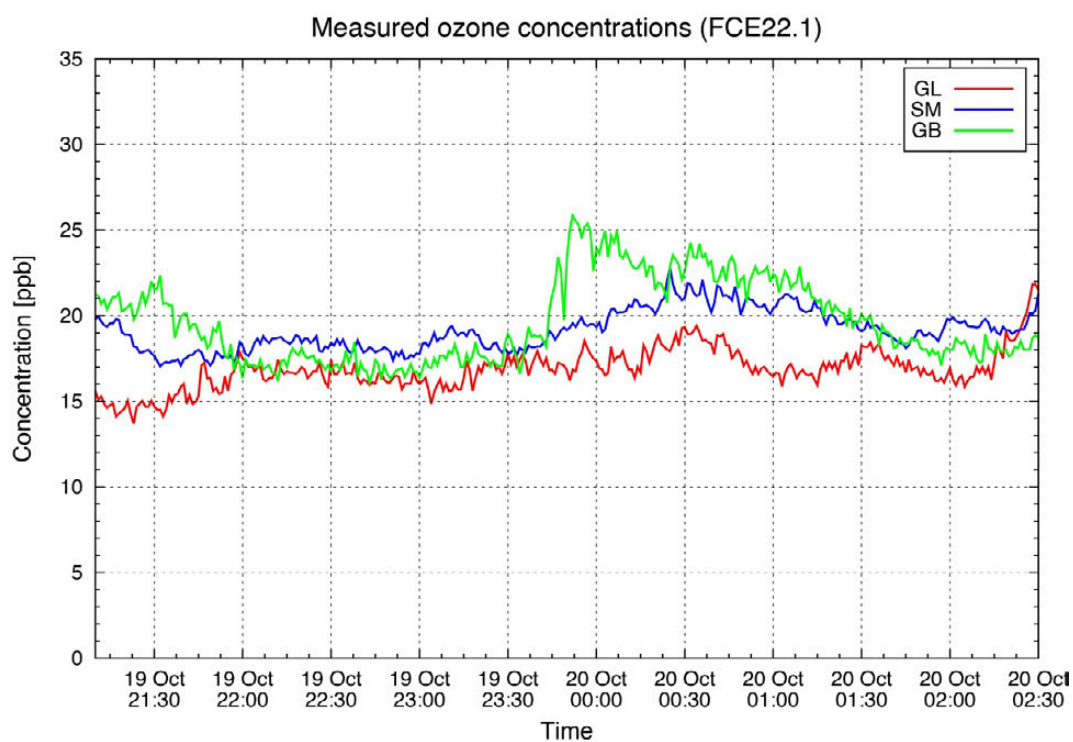


Fig. K 11 Measured ozone concentration over the full event.

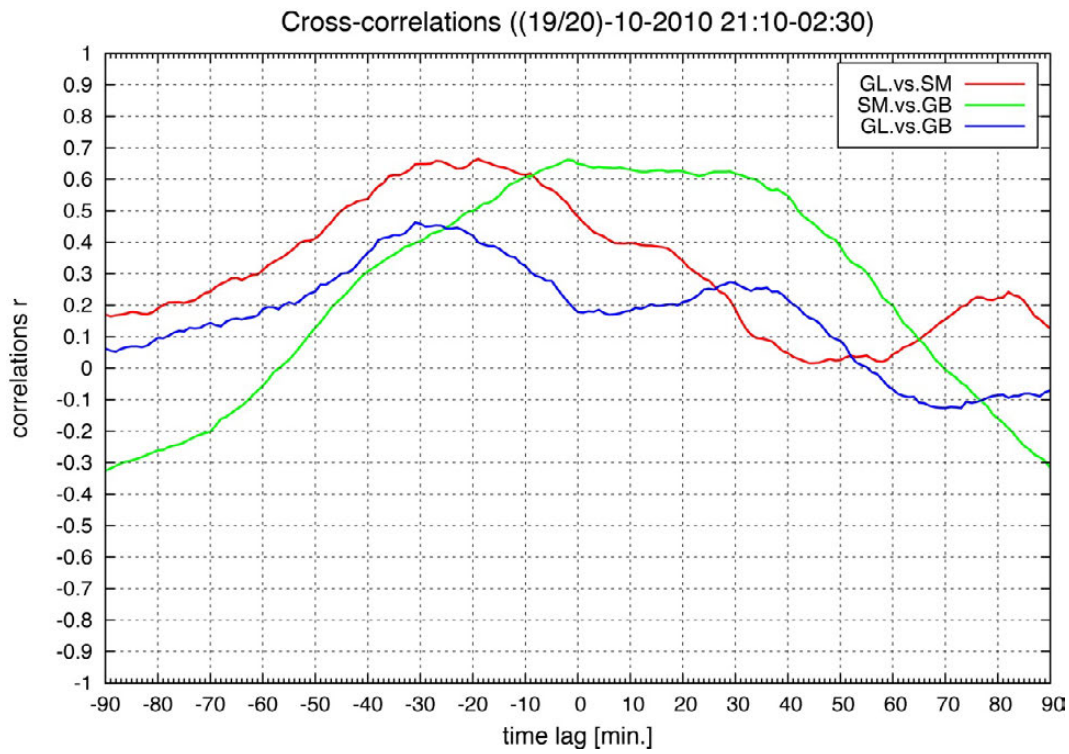


Fig. K 12 Cross-correlation of the full event.

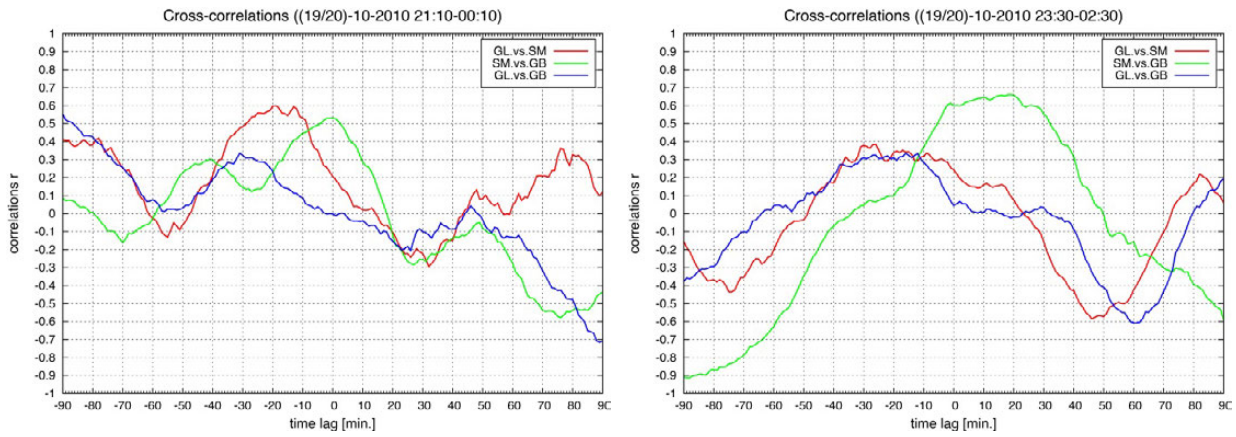


Fig. K 13 Cross-correlation on 19 and 20-10-2010, 21:10 – 00:10 CEST and 23:30 – 02:30 CEST.

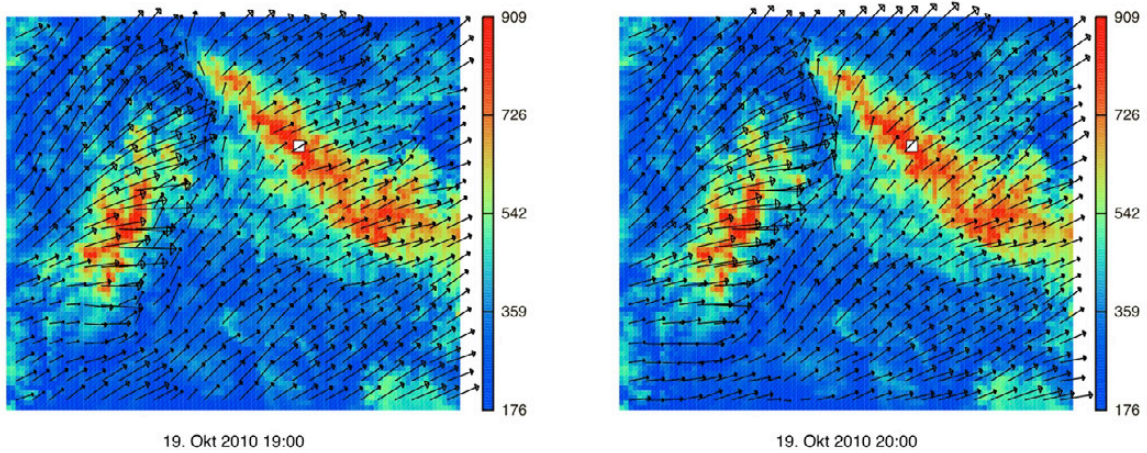


Fig. K 14 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

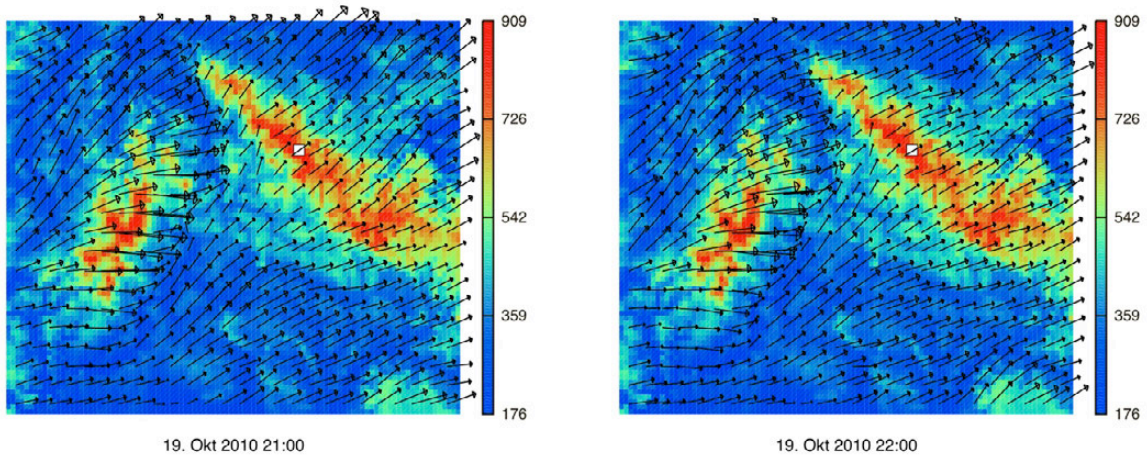


Fig. K 15 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

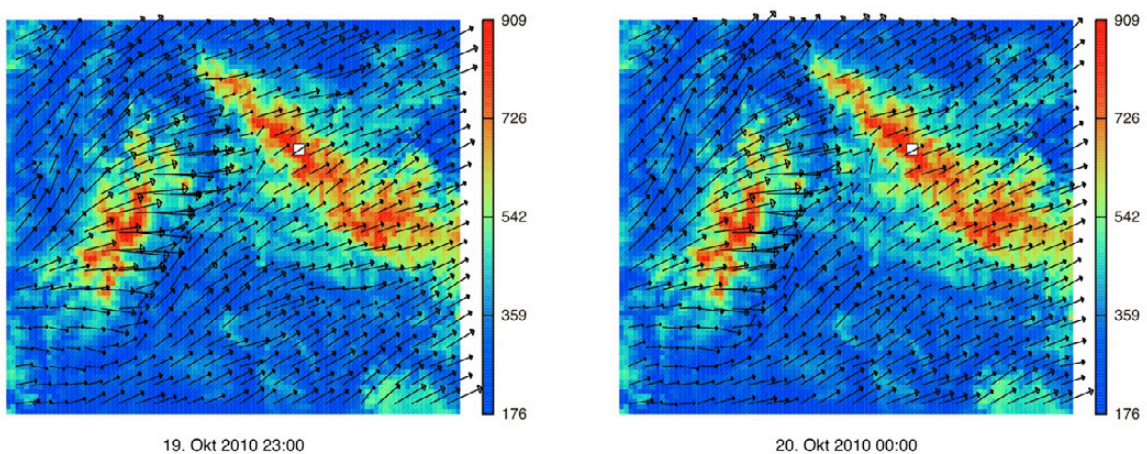


Fig. K 16 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

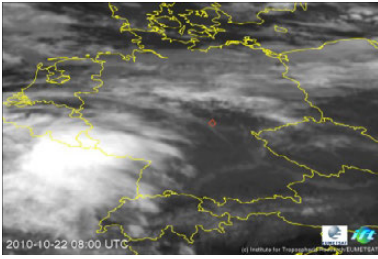


Fig. L 6 IR-satellite picture on 22-10-2010, 08 UTC (source: ©TROPOS/EUMETSAT).

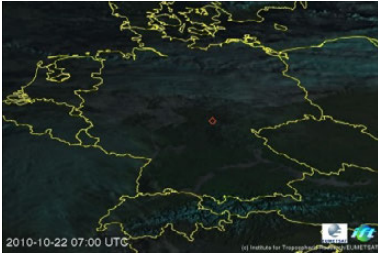


Fig. L 7 VIS-satellite picture on 22-10-2010, 07 and 08 UTC (source: ©TROPOS/EUMETSAT).

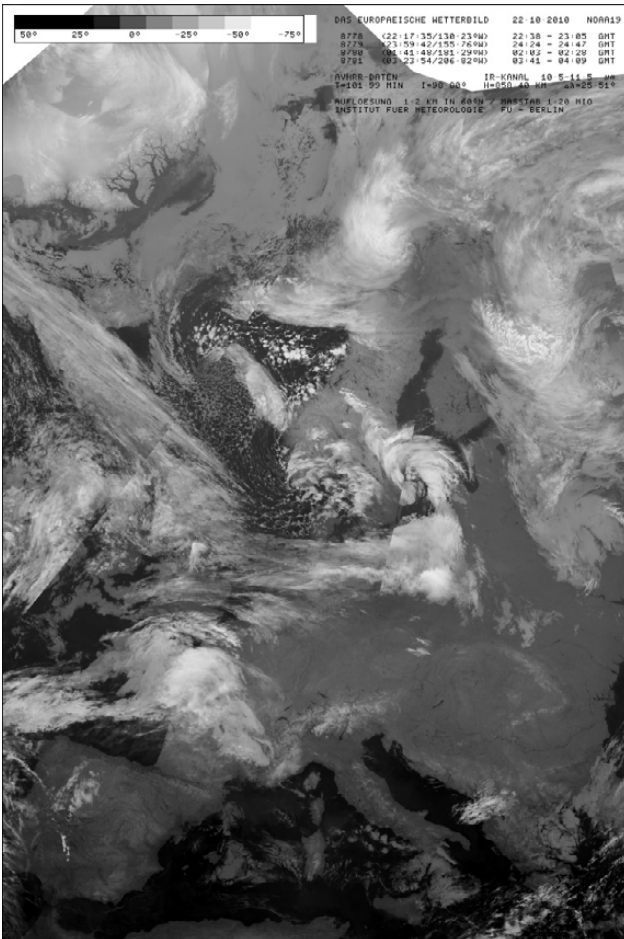


Fig. L 8 NOAA satellite pictures on 22-10-2010 (source: Berliner Wetterkarte e.V., 2010).

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

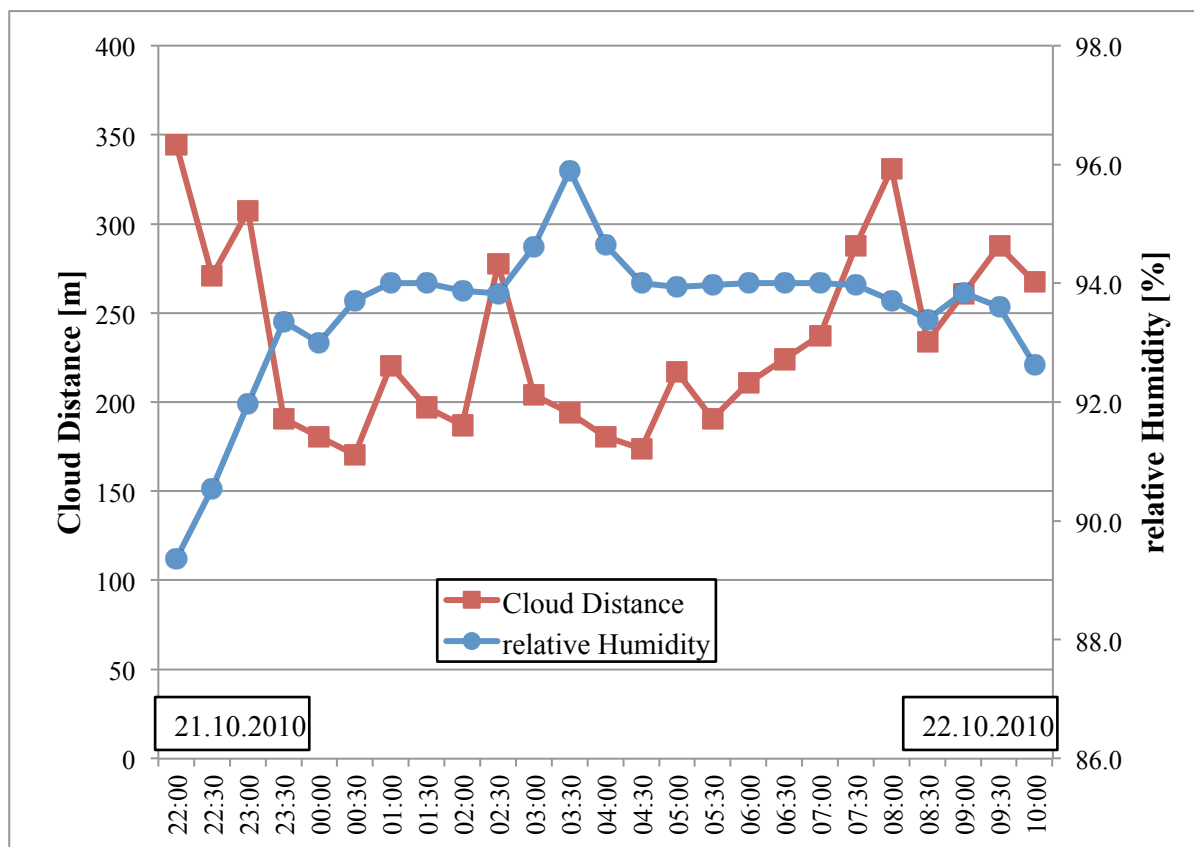


Fig. L 15 Cloud height and relative humidity on cloud event FCE24.0.

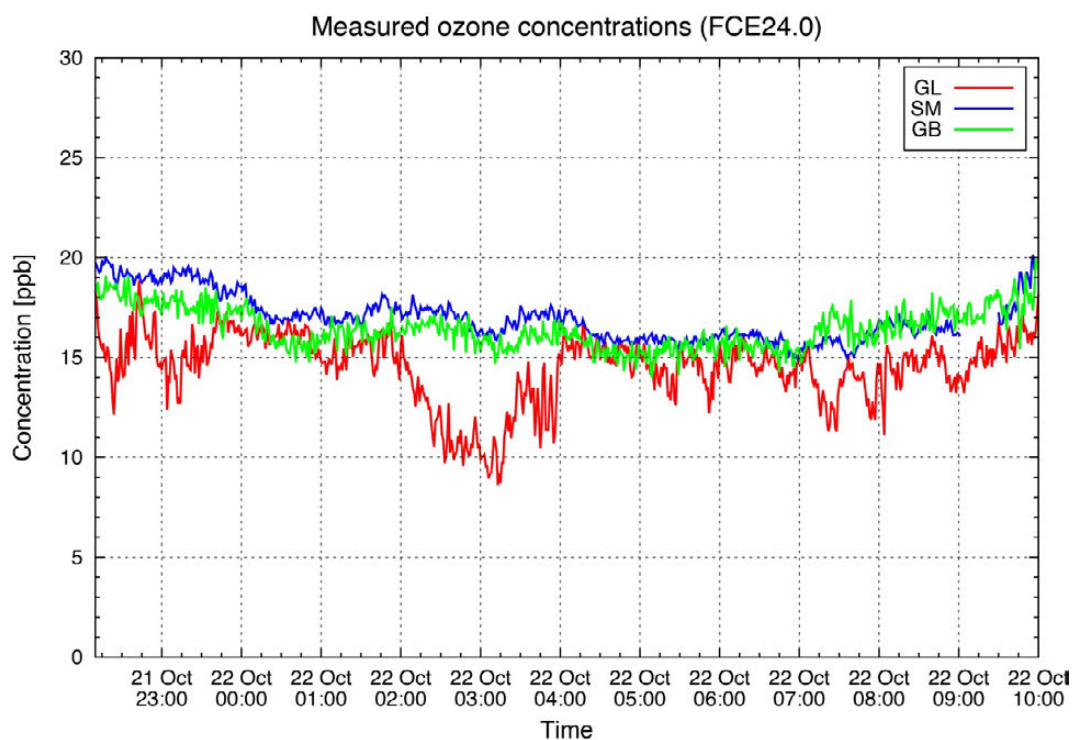


Fig. L 16 Measured ozone concentration over the full event.

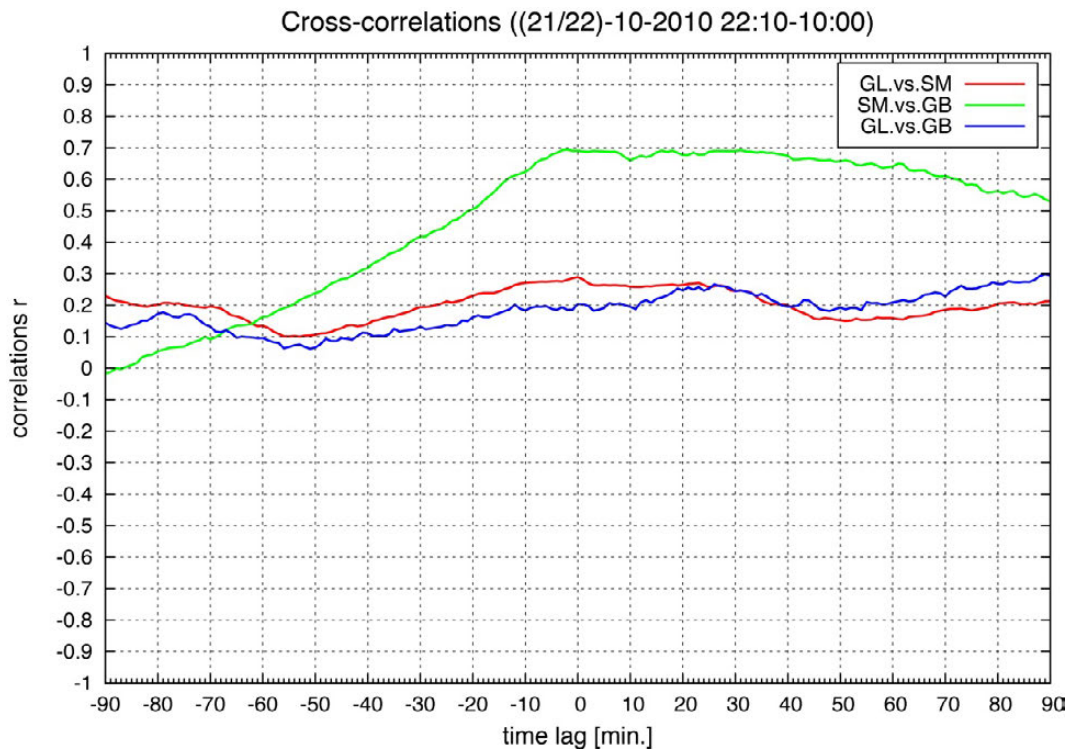


Fig. L 17 Cross-correlation of the full event.

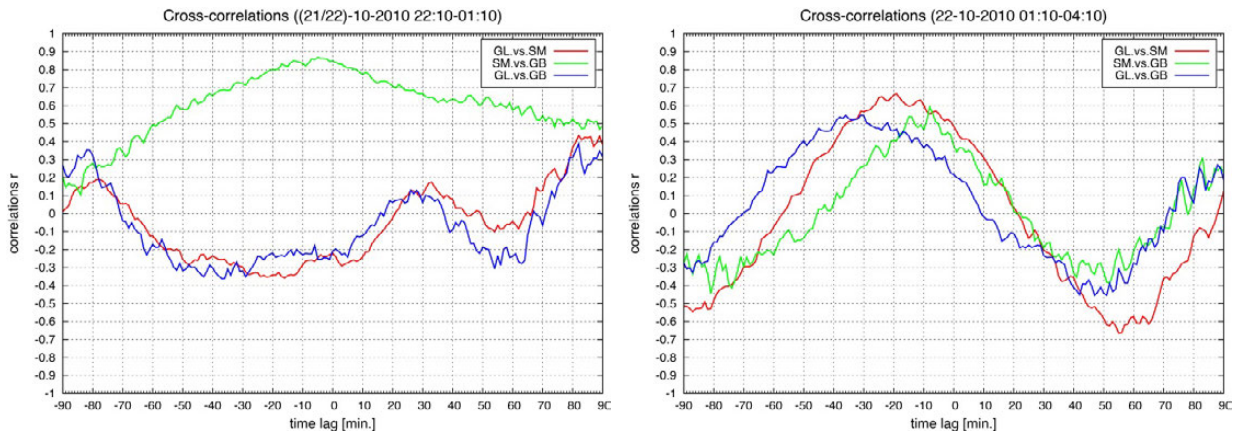


Fig. L 18 Cross-correlation on 21 and 22-10-2010, 22:10 – 01:10 CEST and 01:10 – 04:10 CEST.

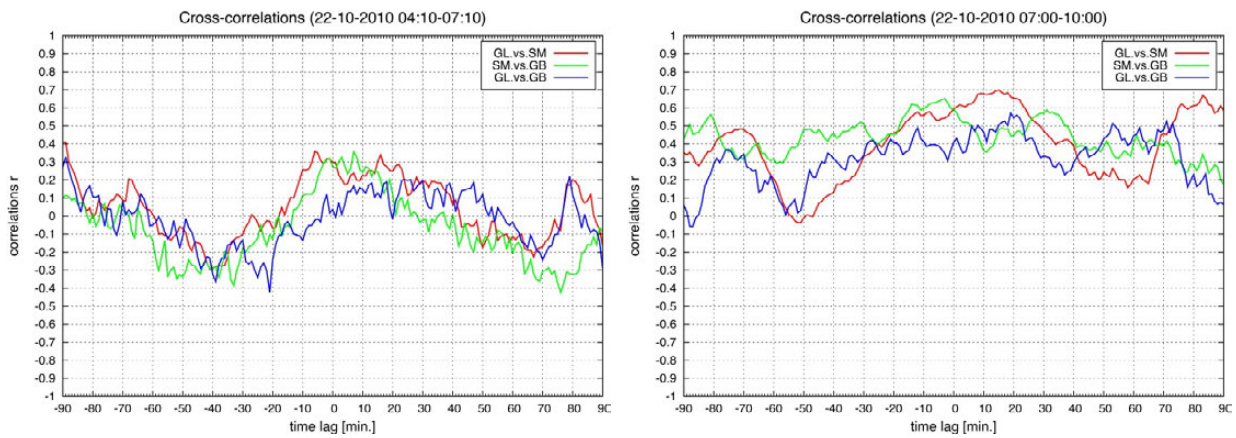


Fig. L 19 Cross-correlation on 22-10-2010, 04:10 – 07:10 CEST and 07:00 – 10:00 CEST.

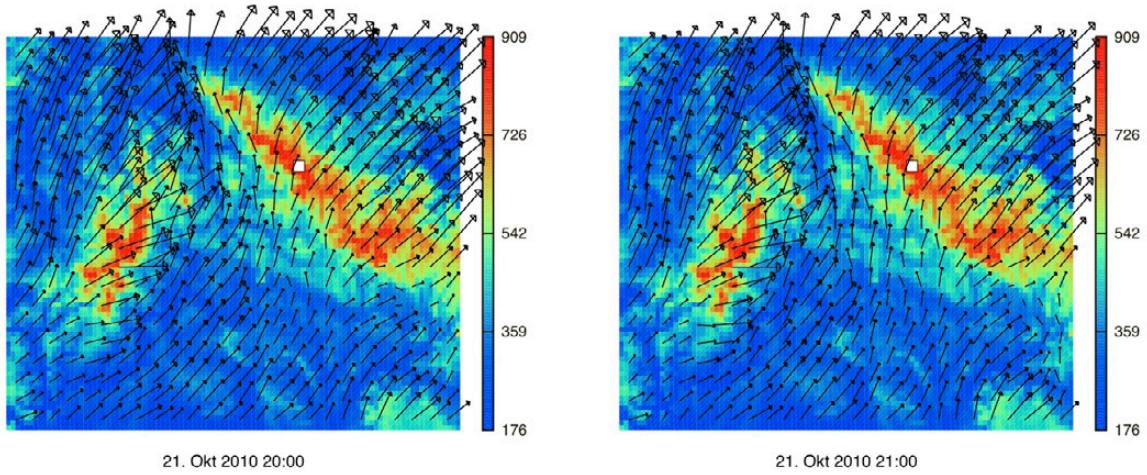


Fig. L 20 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

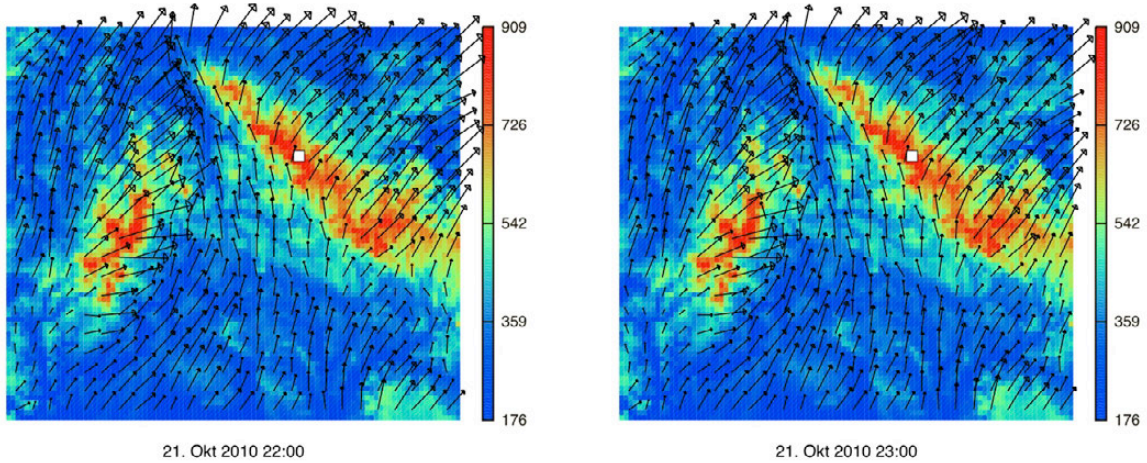


Fig. K 21 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

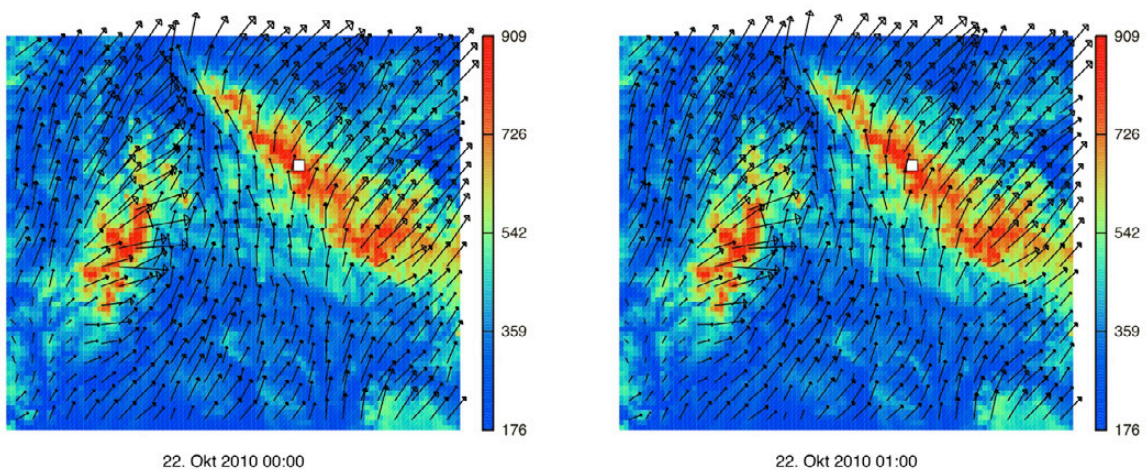


Fig. K 22 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

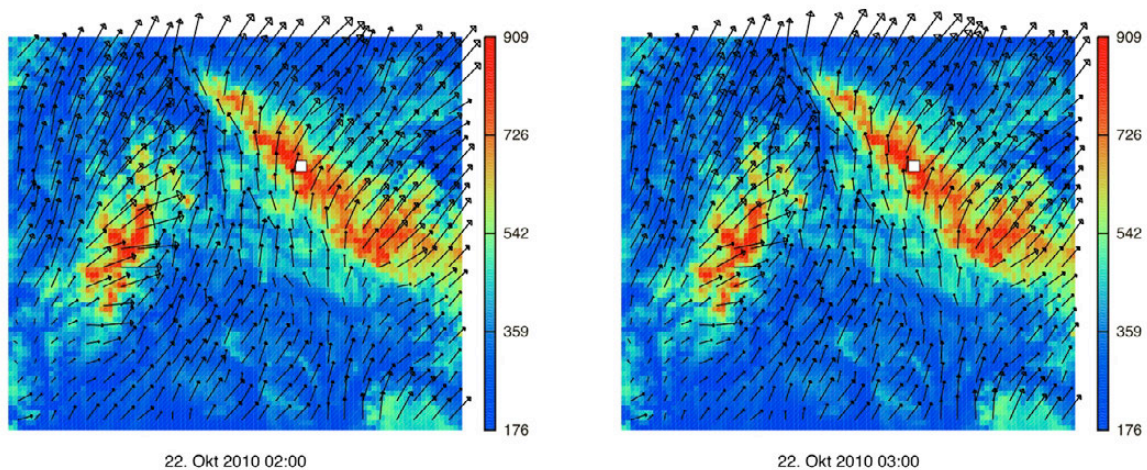


Fig. K 23 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

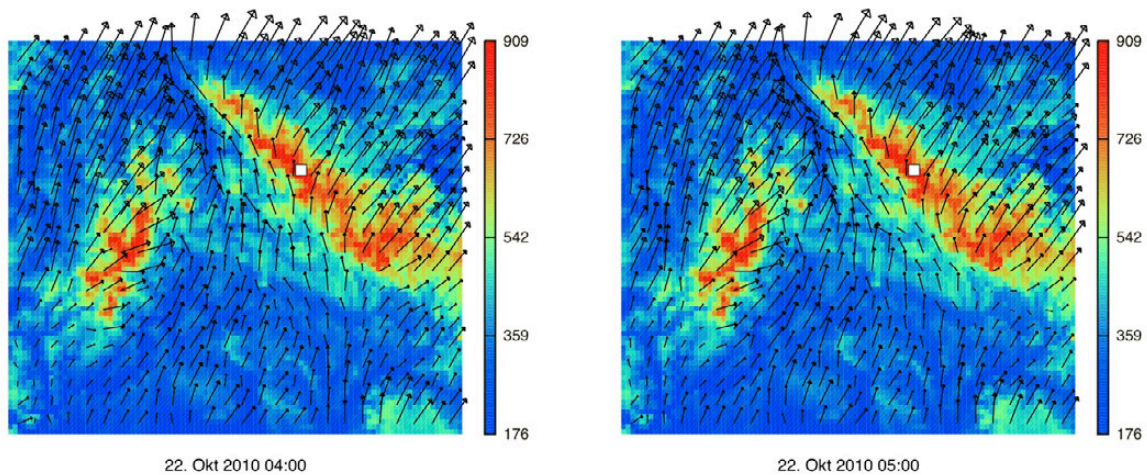


Fig. K 34 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

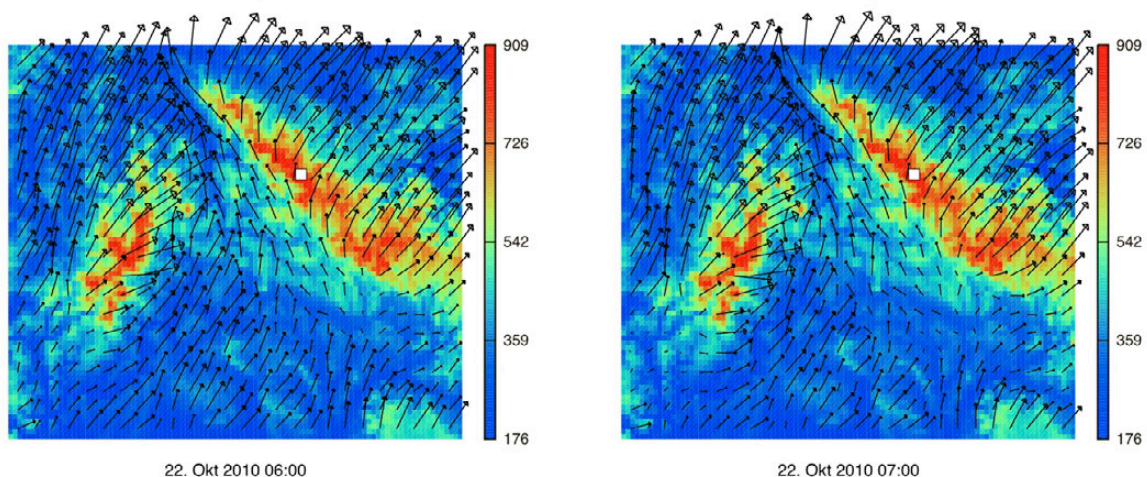


Fig. K 35 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

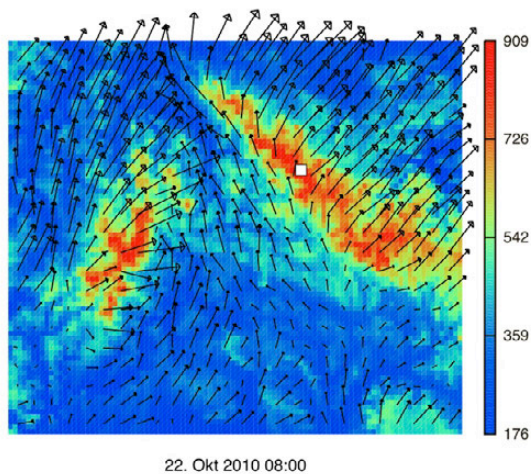


Fig. K 36 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

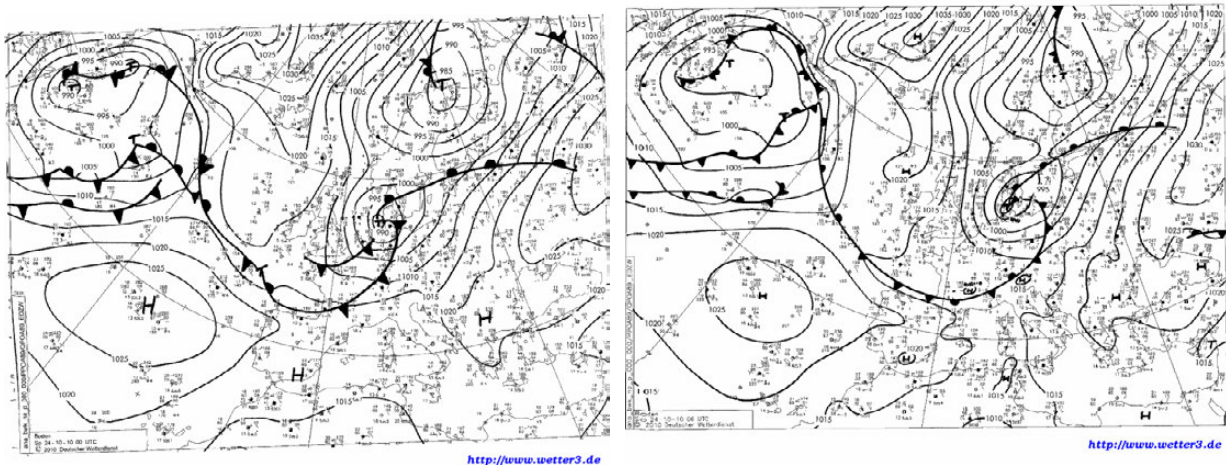


Fig. M 1 Surface weather charts on 24-10-2010, 00 and 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

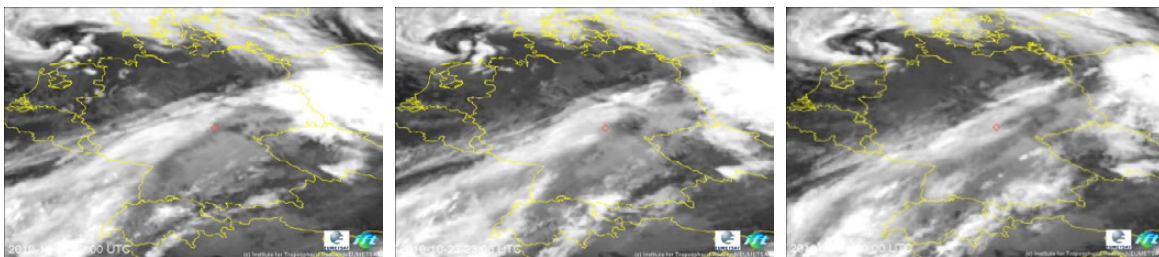


Fig. M 2 IR-satellite picture on 23-10-2010 22 and 23 and 24-10-2010, 00 UTC (source: ©TROPOS/EUMETSAT).

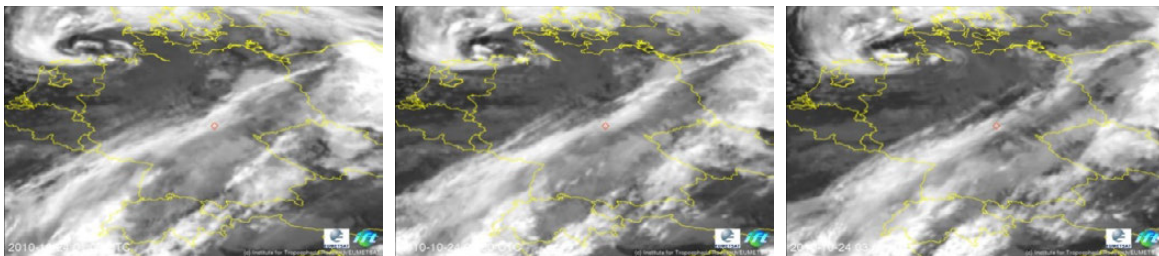


Fig. M 3 IR-satellite picture on 24-10-2010, 01, 02 and 03 UTC (source: ©TROPOS/EUMETSAT).

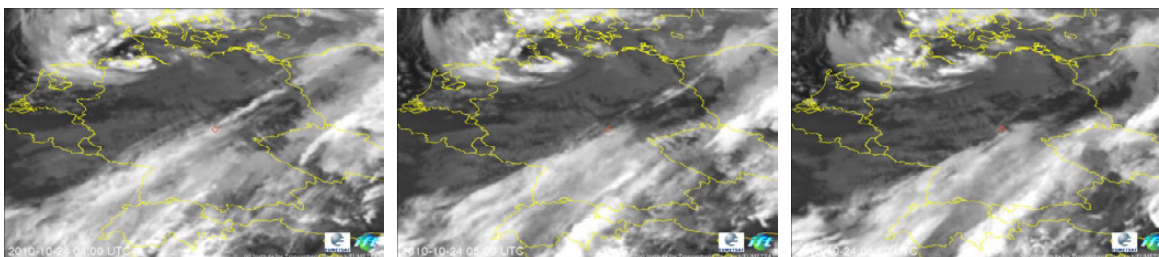


Fig. M 4 IR-satellite picture on 24-10-2010, 04, 05 and 06 UTC (source: ©TROPOS/EUMETSAT).

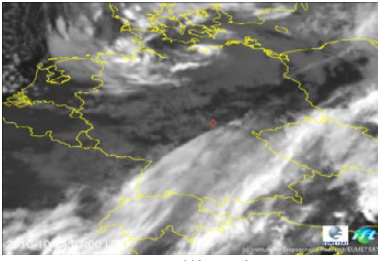


Fig. M 5 IR-satellite picture on 24-10-2010, 07 UTC (source: ©TROPOS/EUMETSAT).

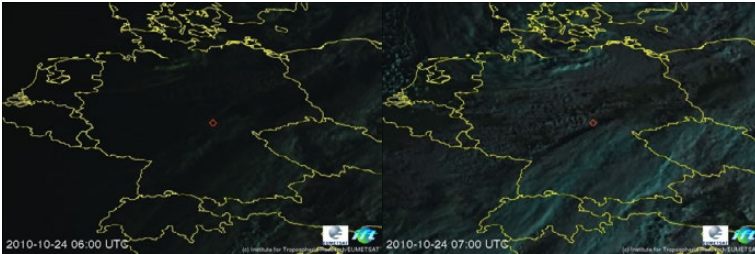


Fig. M 6 VIS-satellite picture on 24-10-2010, 06 and 07 UTC (source: ©TROPOS/EUMETSAT).

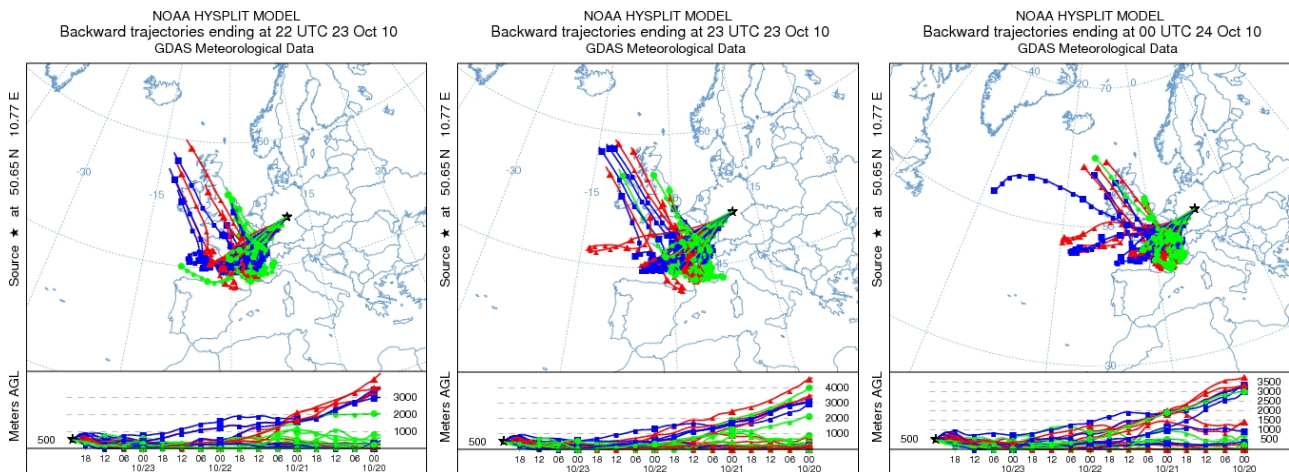


Fig. M 7 Backward trajectories on 23-10-2010 2010, 22 and 23 and on 24-10-2010, 00 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

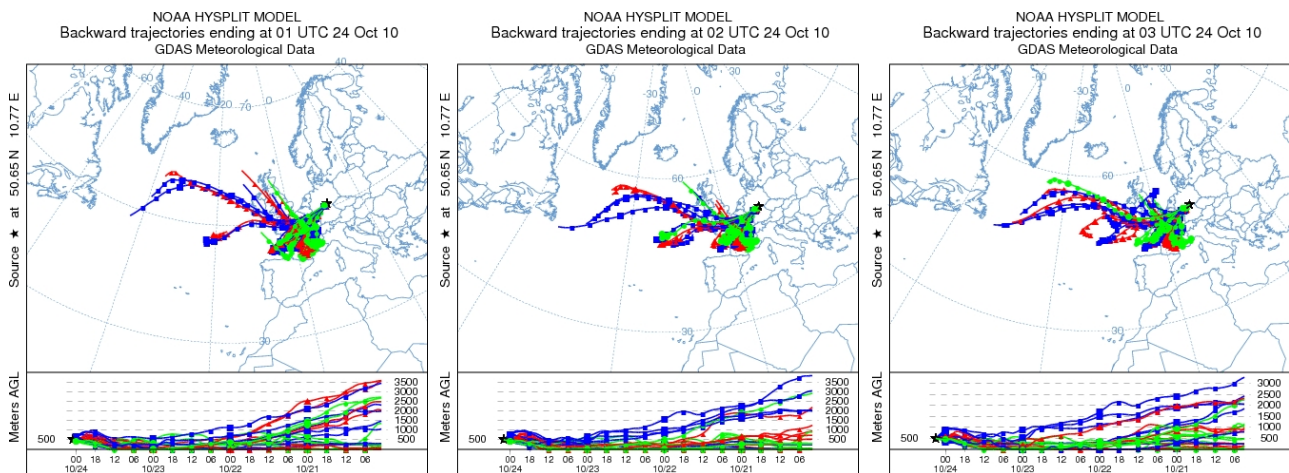


Fig. M 8 Backward trajectories on 24-10-2010, 01, 02 and 03 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

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

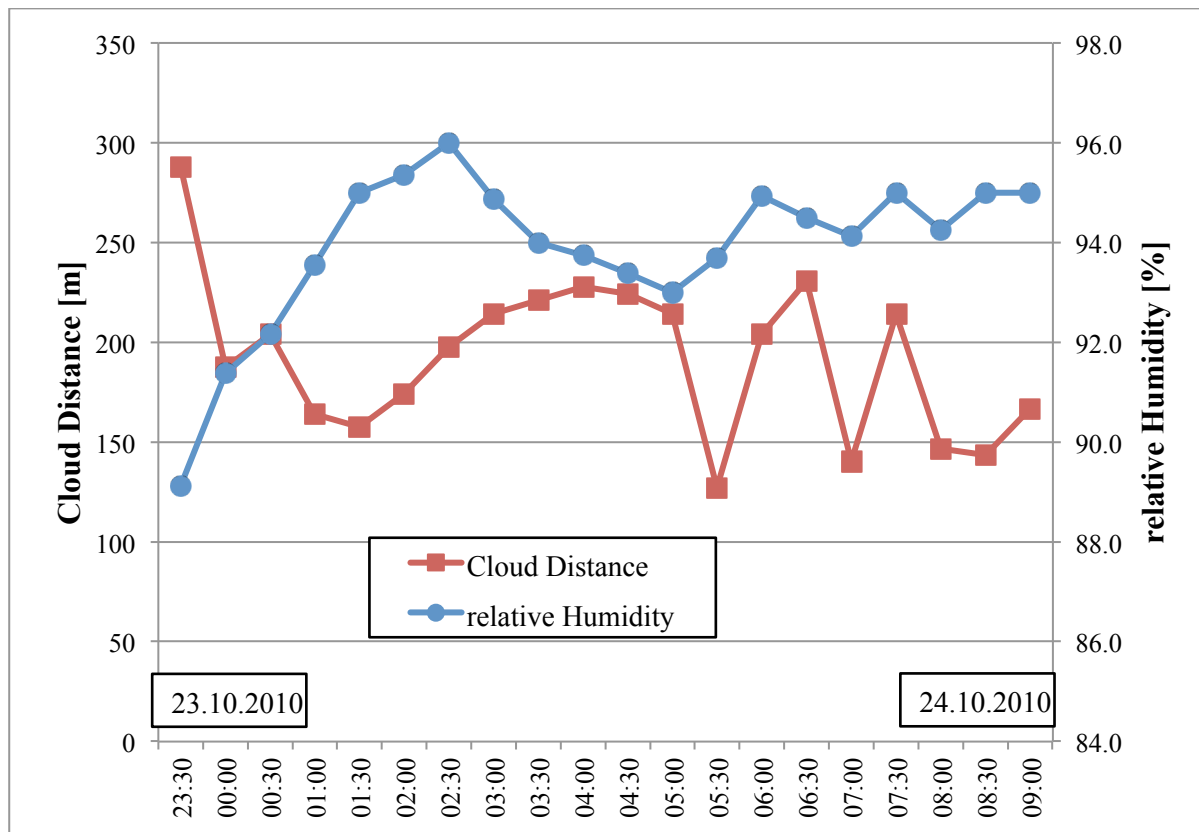


Fig. M 12 Cloud height and relative humidity on cloud event FCE26.1.

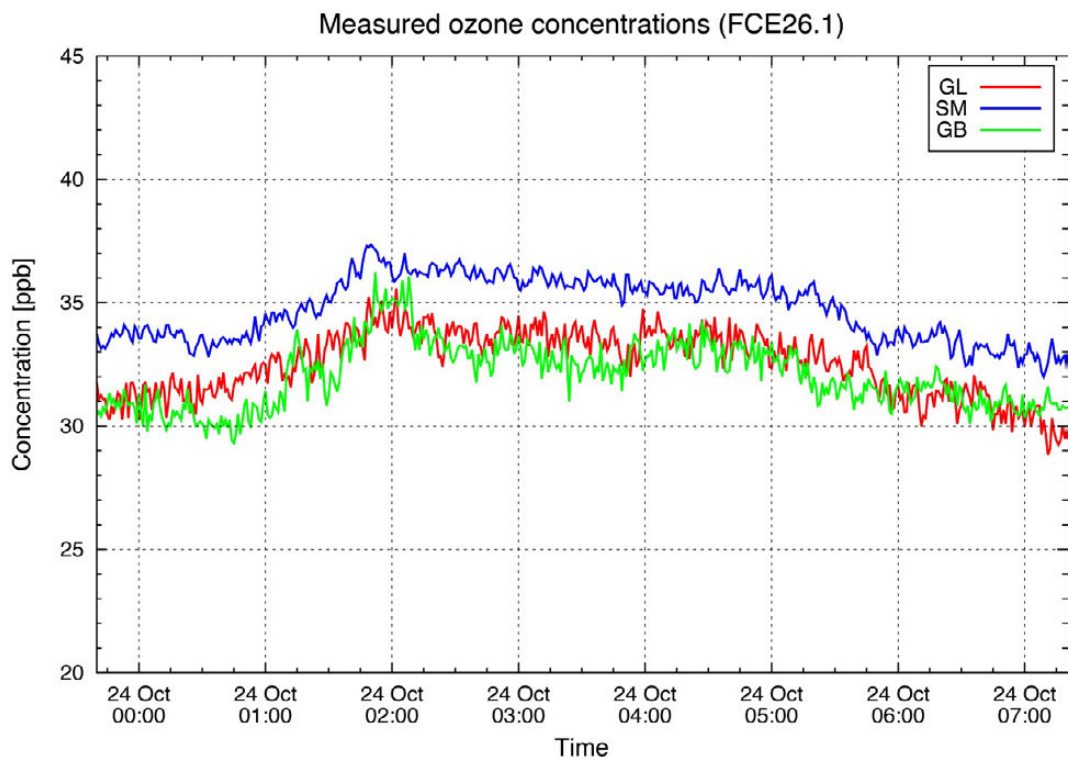


Fig. M 13 Measured ozone concentration over the full event.

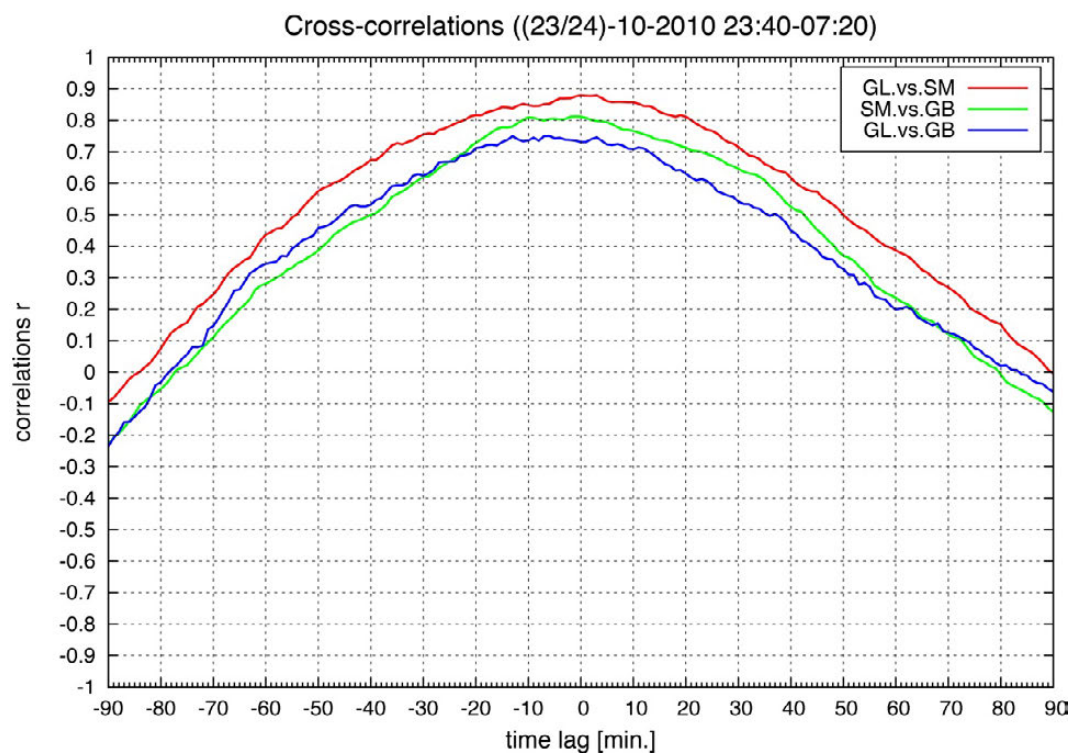


Fig. M 14 Cross-correlation of the full event.

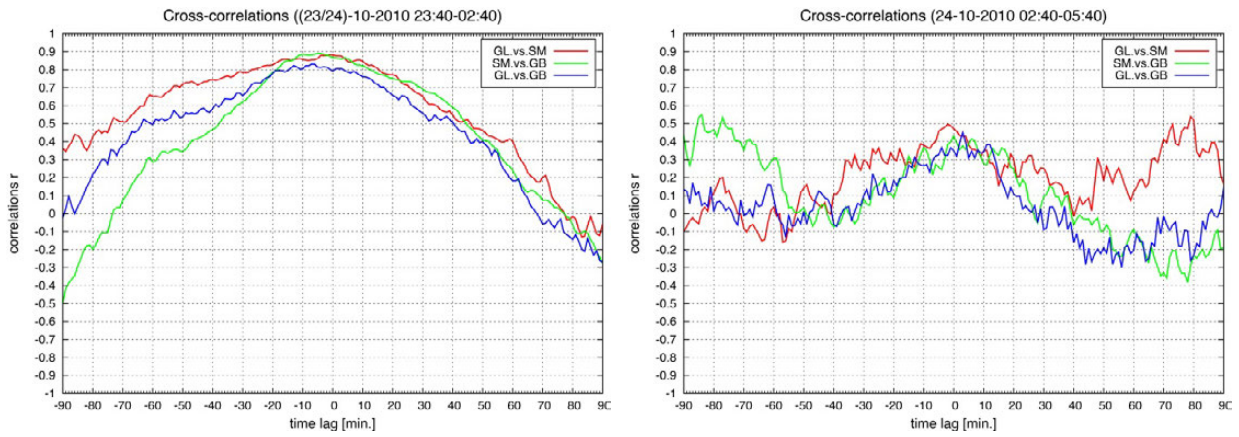


Fig. M 15 Cross-correlation on 23 and 24-10-2010, 23:40 – 02:40 CEST and 02:40 – 05:40 CEST.

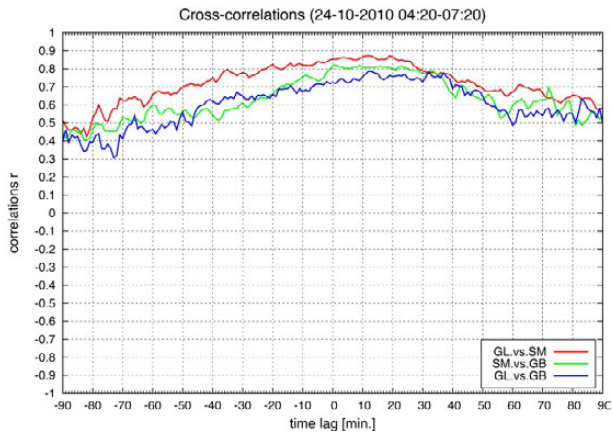


Fig. M 16 Cross-correlation on 24-10-2010, 04:20 – 07:20 CEST.

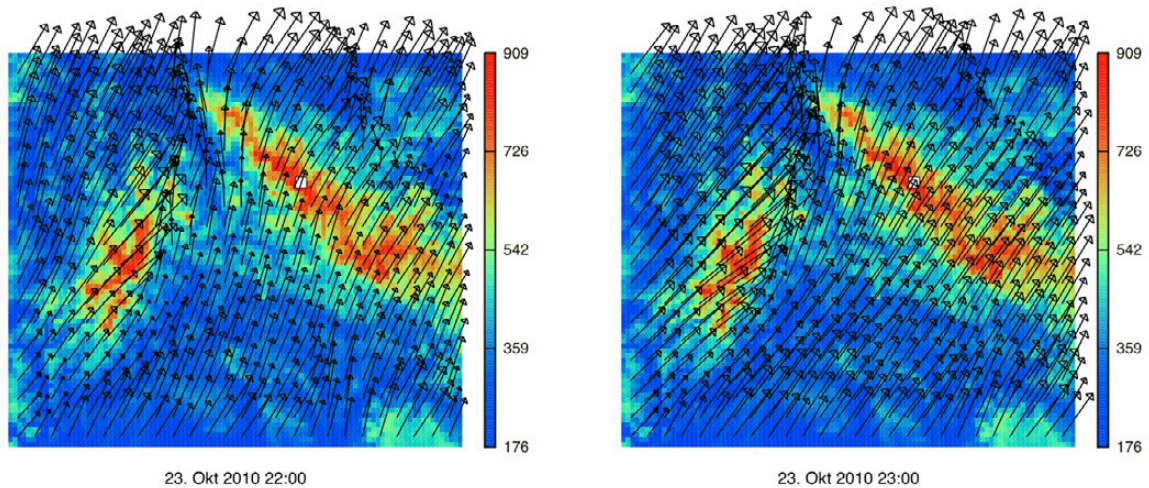


Fig. M 17 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

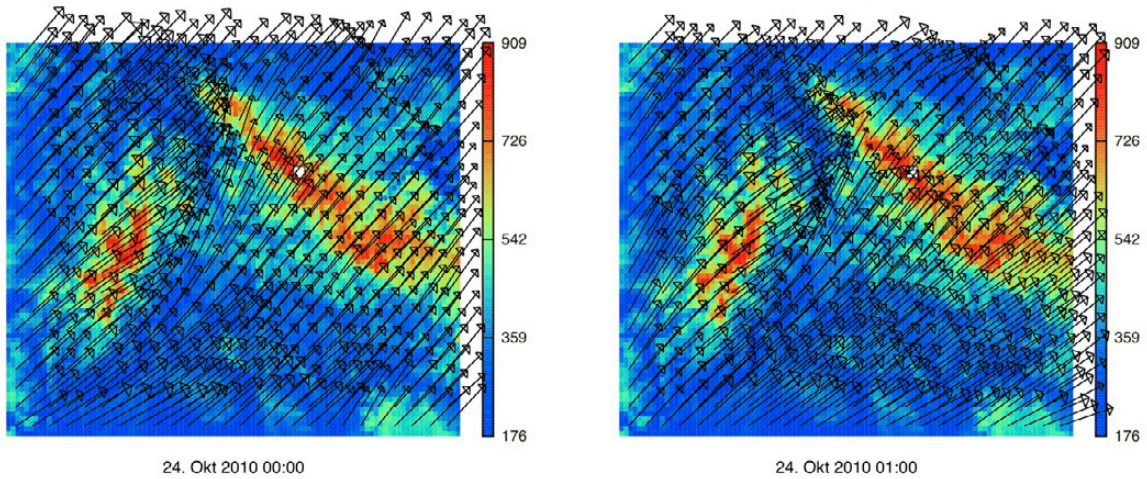


Fig. M 18 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

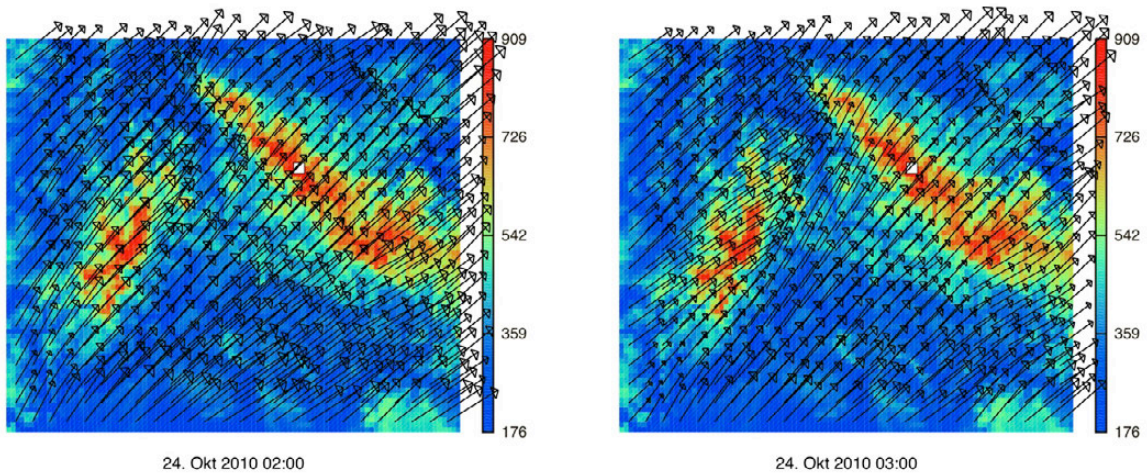


Fig. M 19 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

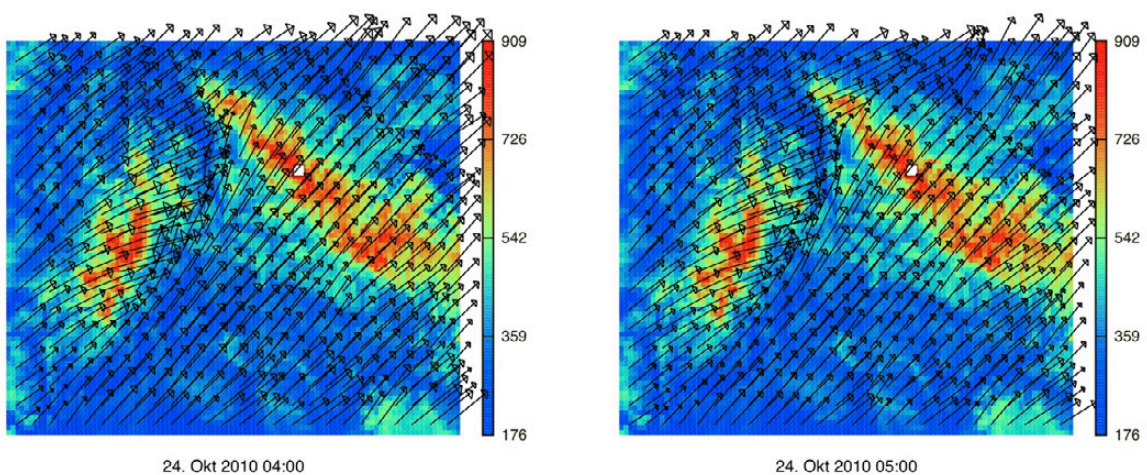


Fig. M 20 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

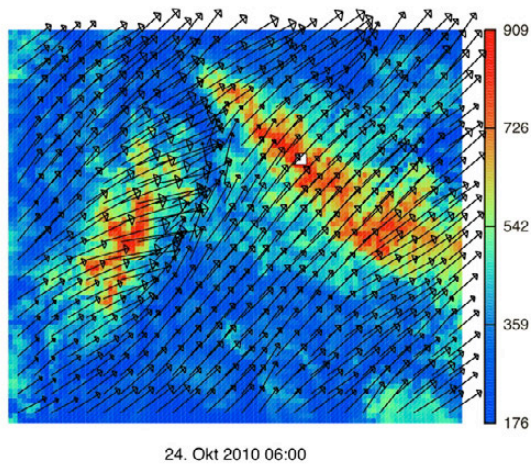


Fig. M 21 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

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

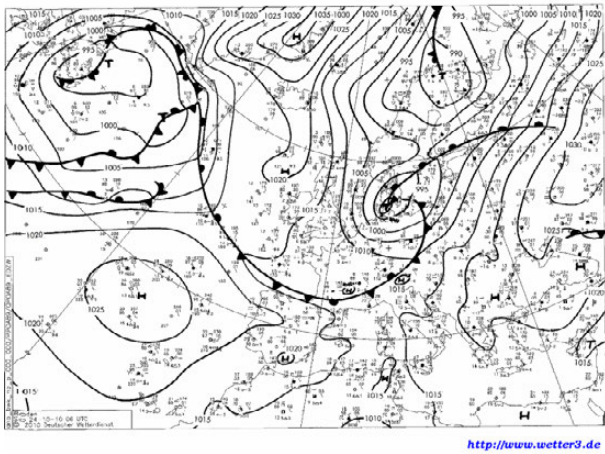


Fig. N 1 Surface weather charts on 24-10-2010, 06 UTC (source: www.wetter3.de (©Deutscher Wetterdienst)).

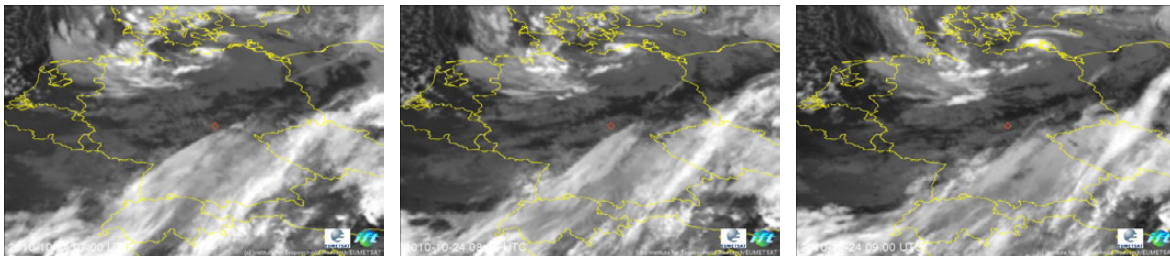


Fig. N 2 IR-satellite picture on 24-10-2010, 07, 08 and 09 UTC (source: ©TROPOS/EUMETSAT).

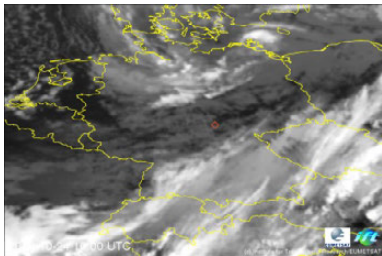


Fig. N 3 IR-satellite picture on 24-10-2010, 10 UTC (source: ©TROPOS/EUMETSAT).

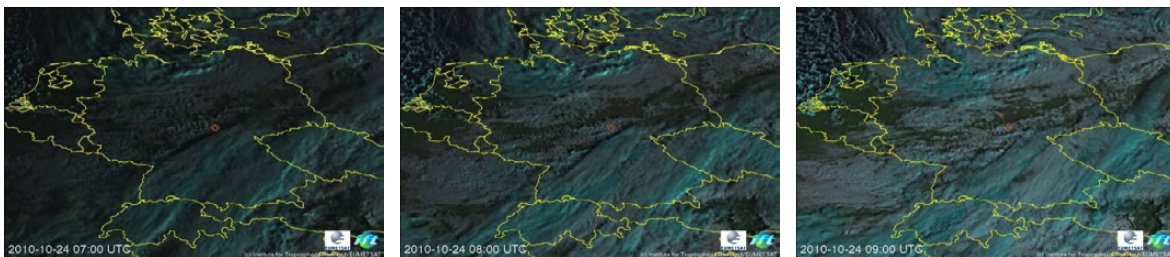


Fig. N 4 VIS-satellite picture on 24-10-2010, 07, 08 and 09 UTC (source: ©TROPOS/EUMETSAT).

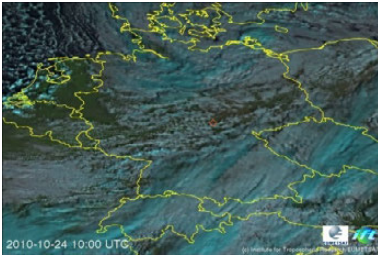


Fig. N 5 VIS-satellite picture on 24-10-2010, 10 UTC (source: ©TROPOS/EUMETSAT).

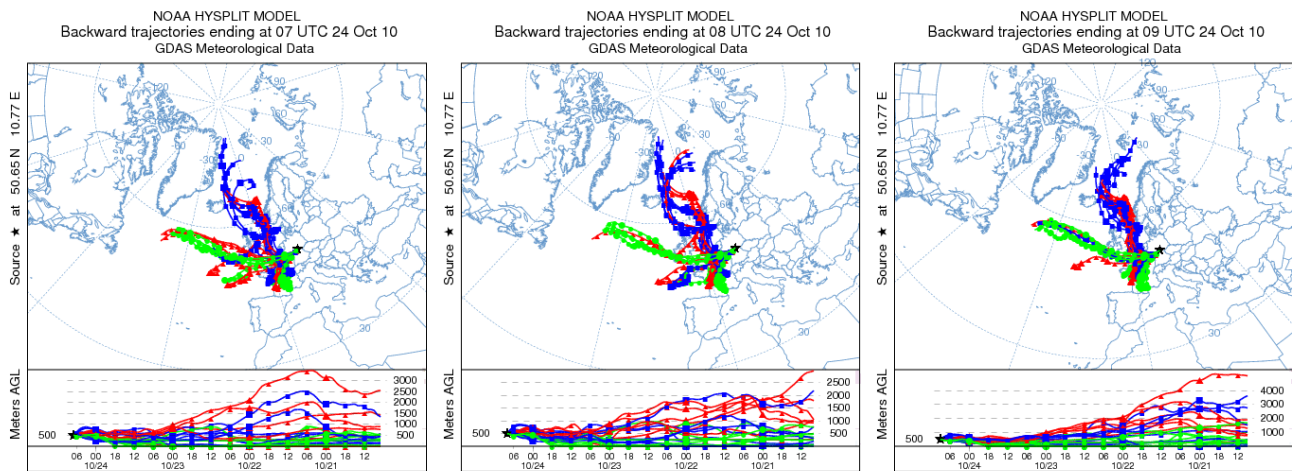


Fig. N 6 Backward trajectories on 24-10-2010, 07, 08 and 09 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

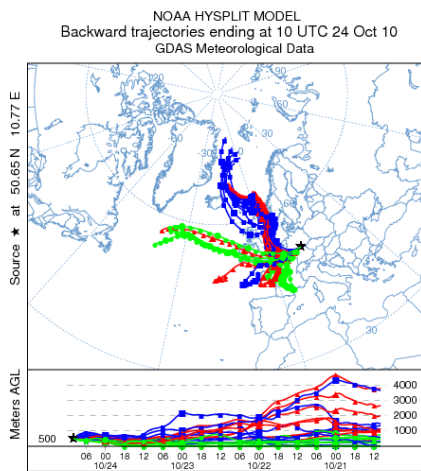


Fig. N 7 Backward trajectories on 24-10-2010, 10 UTC (source: NOAA Air Resources Laboratory (<http://ready.arl.noaa.gov/HYSPLIT.php>)).

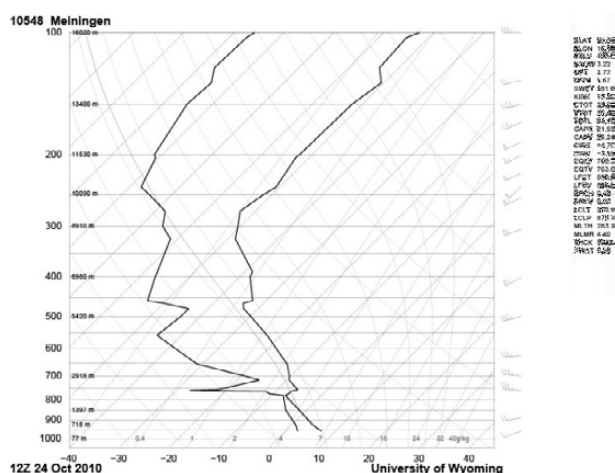


Fig. N 8 Vertical rawinsonde profiles of temperature and dew-point temperature on 24-10-2010, 12 UTC (source: <http://weather.uwyo.edu/upperair/sounding.html>).

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

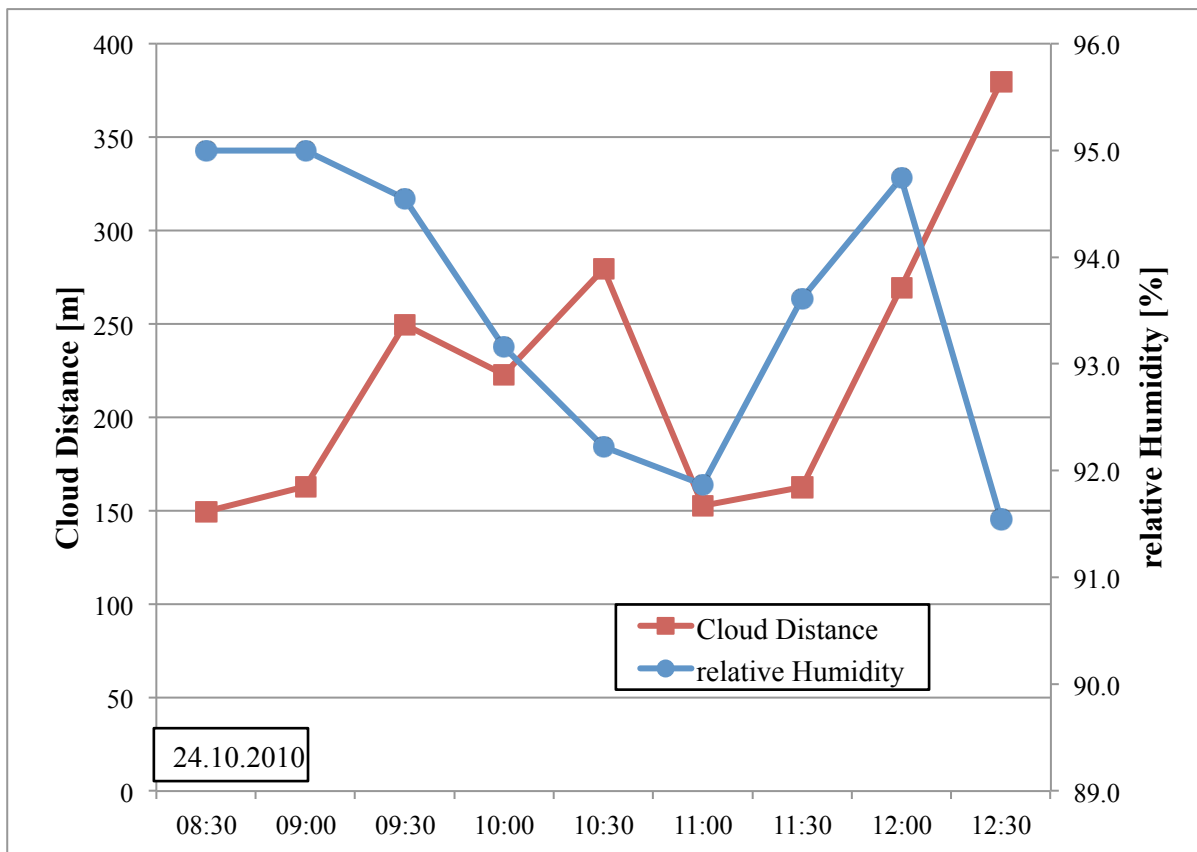


Fig. N 9 Cloud height and relative humidity on cloud event FCE26.2.

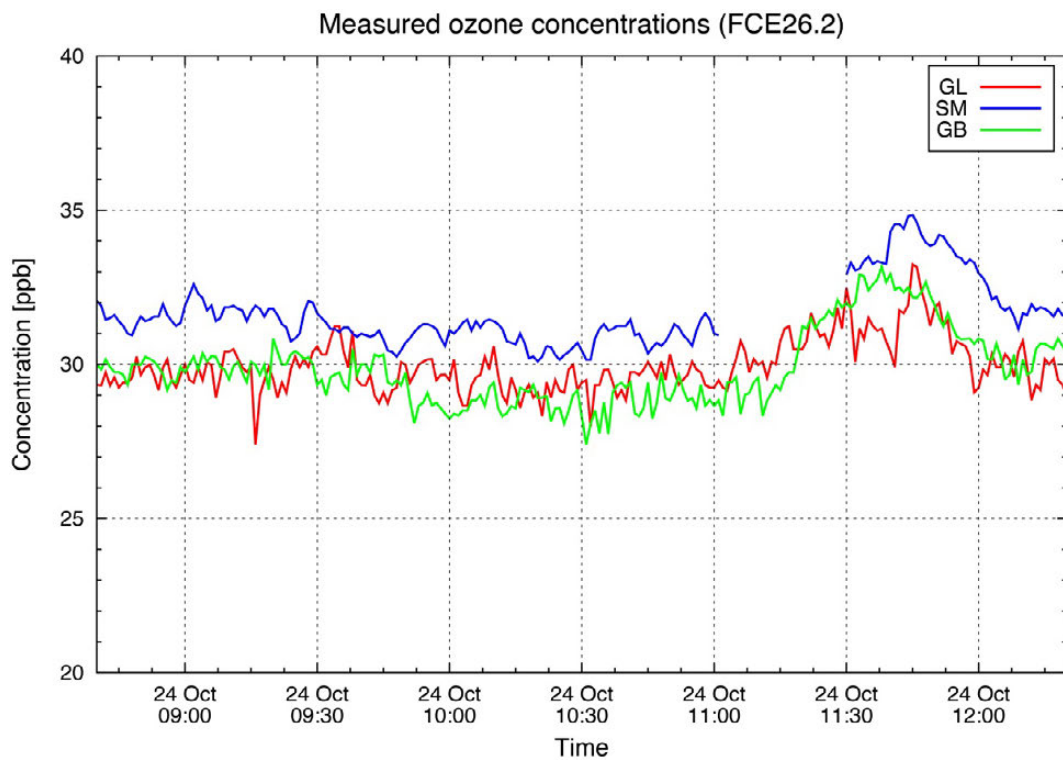


Fig. N 10 Measured ozone concentration over the full event.

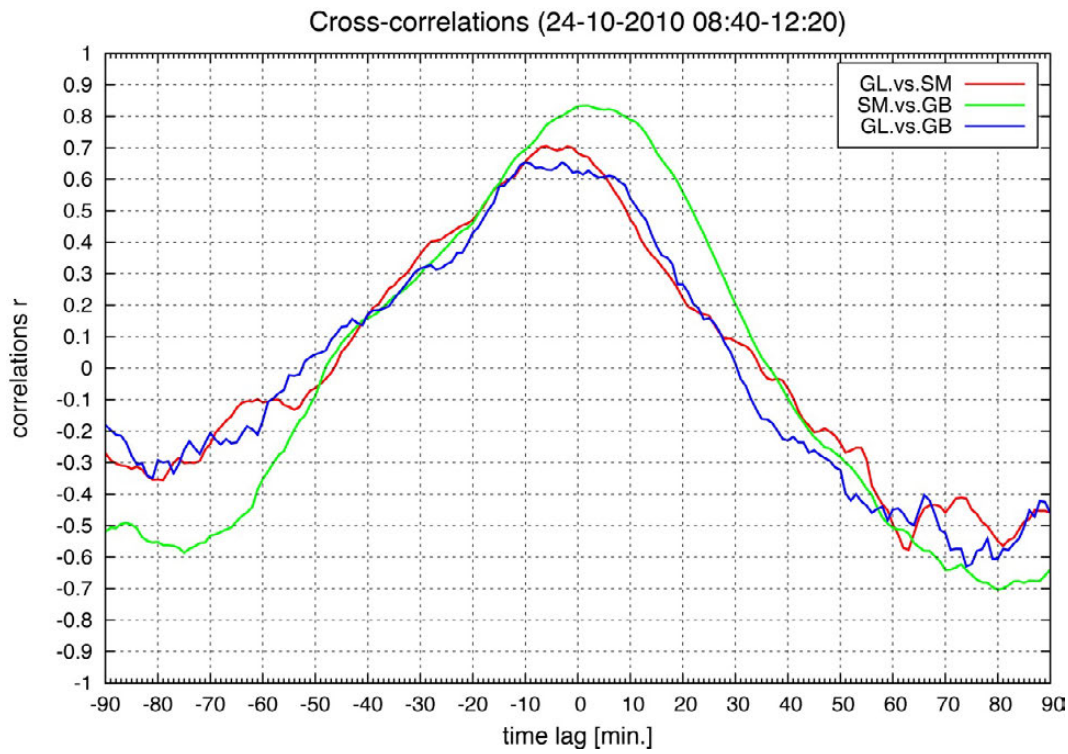


Fig. N 11 Cross-correlation of the full event.

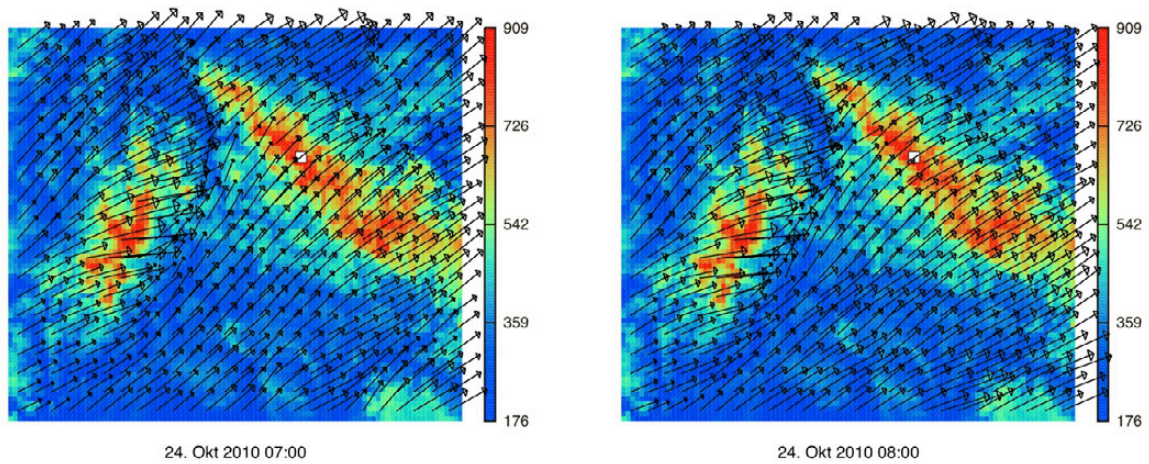


Fig. N 12 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.

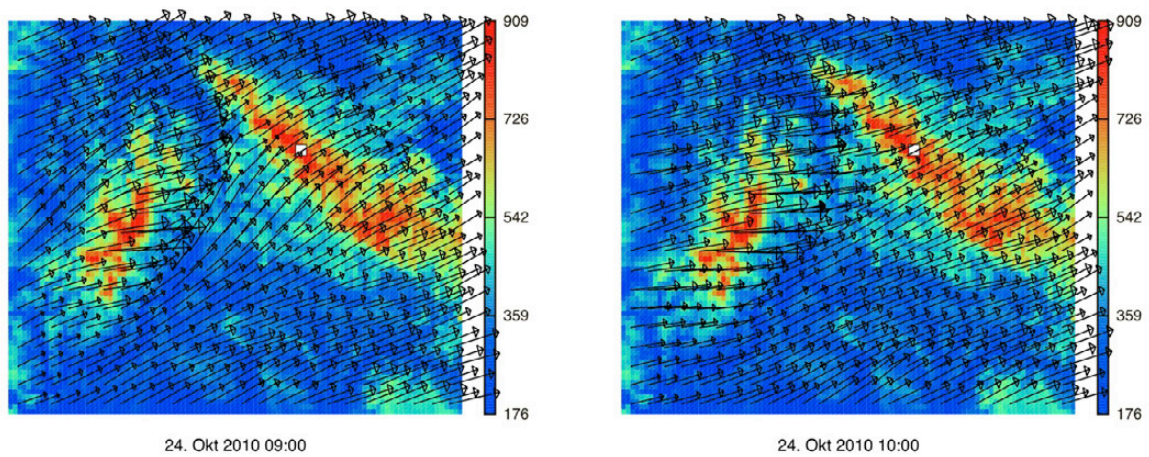


Fig. N 13 Depiction of the horizontal cross-section of the topography and the wind conditions (black arrows) above the ground for the COSMO-MUSCAT model domain at the particular time (UTC) given in the plot. The white square marks the Mt. Schmücke area.