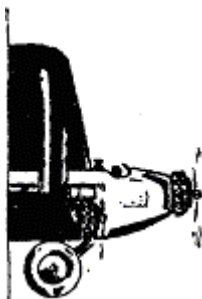


Quarterly reports of the E-AMDAR Quality Evaluation Centre on AMDAR data

2004-I

Report number 18 23 June 2004

Period: 1 January 2004 – 31 March 2004



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1) Introduction

AMDAR offers the potential for a large increase in upper air wind and temperature data, observed for use as input for models. To improve the usefulness of these data, quality evaluation is essential in combination with appropriate impact studies. Today the E-AMDAR fleet will number approximately 801 assigned aircraft, 80% of which will fly predominantly European routes and the remainder long haul. All E-AMDAR data for evaluation will be made available on the GTS with in near real time performances. ***It should be noted that not all identified aircraft are fully operational at present*** (operational on April, 1st, 2004: 444).

The purpose of this report is to provide statistical information on the quality, quantity and availability of aircraft reports made available from all Participating Members. The information will be used for further impact studies and feed back to the E-AMDAR operators to improve the quality of the E-AMDAR observing system.

The Quality Evaluation Centre has monitored AMDAR reports received at KNMI since September 17th 1999. The aim of the monitoring process is to detect and identify any incorrectness or anomalies of the data or transmission within 24 hours and to instigate fault correction procedures. Such a process is vital for maintaining data quality and credibility at the required level. The monitoring of the observations covers data availability, receipt delays, reporting frequency and checks on the consistency and quality of the meteorological data.

The EUMETNET Council agreed in September 1998 that the Met Office would be the Responsible Member for the E-AMDAR Programme. On January, 1st 2003, however, this responsibility is transferred to SMHI and from that date the Programme Manager is Mr Ture Hovberg. Nevertheless, the appointed Technical Co-ordinator, Mr Stewart Taylor, has continued the work that will ensure that any faults identified are investigated and rectified in a timely manner. All irregularities on E-AMDAR data will be reported to the Programme Manager.

Observations period: The coverage of the data used for the statistical analysis for AMDAR reporting aircraft is the period January 1st, 2004, 00:00 UTC to March 31st, 2004, 24:00 UTC (2004Q1).

2) Operational AMDAR units

Data from the set of 444 *activated* E-AMDAR units producing **FM 42-IX** *or* **BUFR AMDAR** code were received and analysed at the KNMI QEvC in De Bilt during the stated period. However, from 63 activated aircraft no data was received. In addition to these aircraft, data was received during this period from other 44 'officially' *non-activated* aircraft. As a result E-AMDAR data was received from 425 aircraft, a nominal amount.

Notice that a number of aircraft only report during the ascending and descending phases. For a list of reporting aircraft and their identifiers, see [table 1](#). In this table aircraft are indicated, which were activated or deactivated during this period.

3) List of outstanding issues

Code errors

In previous quarterly reports a number of issues concerning errors in the FM 42-IX AMDAR code bulletins were presented. During this quarter, both the standard error check and regular random check routines at the QEvC did almost not find any erroneous bulletins. This is very remarkable with respect to many other WMO bulletins, disseminated through the GTS. Coding errors are corrected by the quality checking routines implemented within the E-AMDAR Data Acquisition System (E-ADAS). This is the central processing system for AMDAR data before insertion to the GTS. More information on E-ADAS can be obtained from the E-AMDAR Technical Co-ordinator. Although the issue of code errors seems to be diminished to a highly acceptable minimum, the code checking of the received bulletins will be continued.

The remarkable erroneous bulletins reported in the past (like incorrect day numbers found just after some midnights) were not observed anymore.

For some aircraft errors in the reporting positions were found. Encoding errors like reported in 2003Q2 were not identified, but horizontal biases of about 10 to 20 km were found. In fig. 1. a example of such an error is shown for an aircraft taking off at Amsterdam International Airport Schiphol (EHAM).

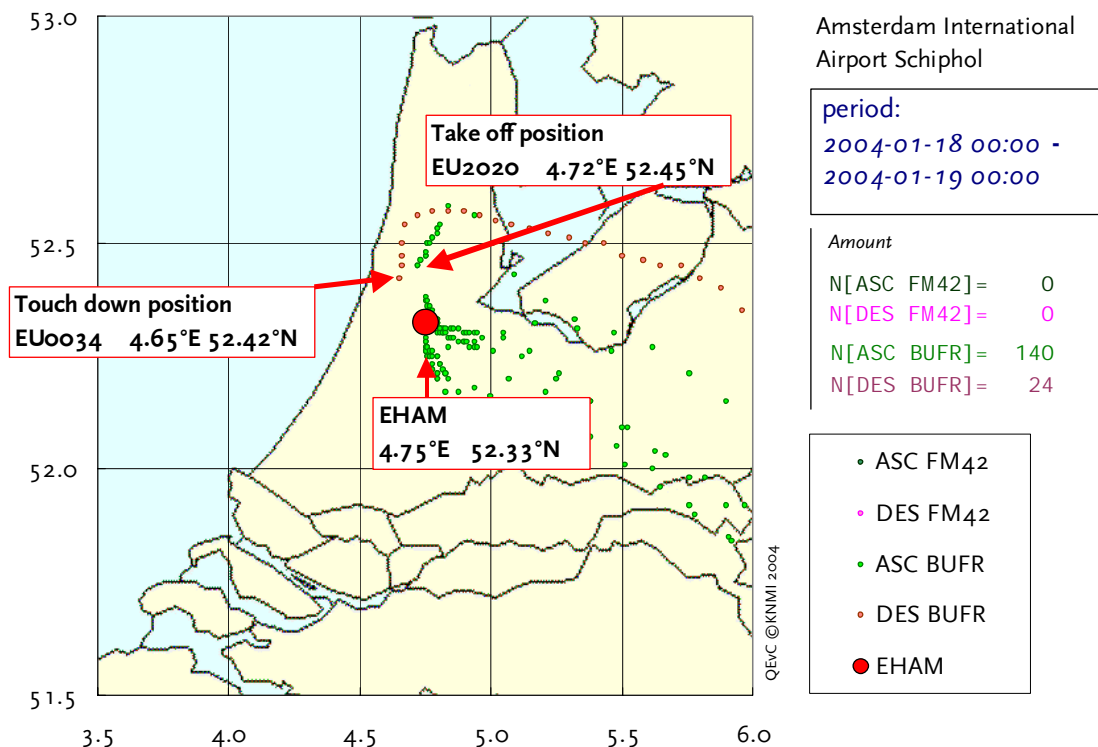


Fig. 1. Reported positions from some observing aircraft ascending or descending at Schiphol. Aircraft EU2020 takes off at about 25 km north of the airfield. (Date: 2004-01-18 08:12 UTC), EU0034 touches the ground about 20 km NW of the airfield (Date: 2004-01-18 21:32 UTC). Examples like these are observed throughout the whole quarter.

Typically BUFR encoded reports never show observations at negative pressure altitudes. At Schiphol airport (altitude = -6 m + MSL) the pressure altitude at runway level will be negative in case the atmospheric pressure > 1013.2 hPa (e.g. -130 m if $p_{MSL} = 1030$ hPa). In the previous report examples of such negative values are shown as reported by FM42 reporting aircraft. Nevertheless aircraft encoding in BUFR stop or start reporting if pressure altitude is zero (see fig. 2.)

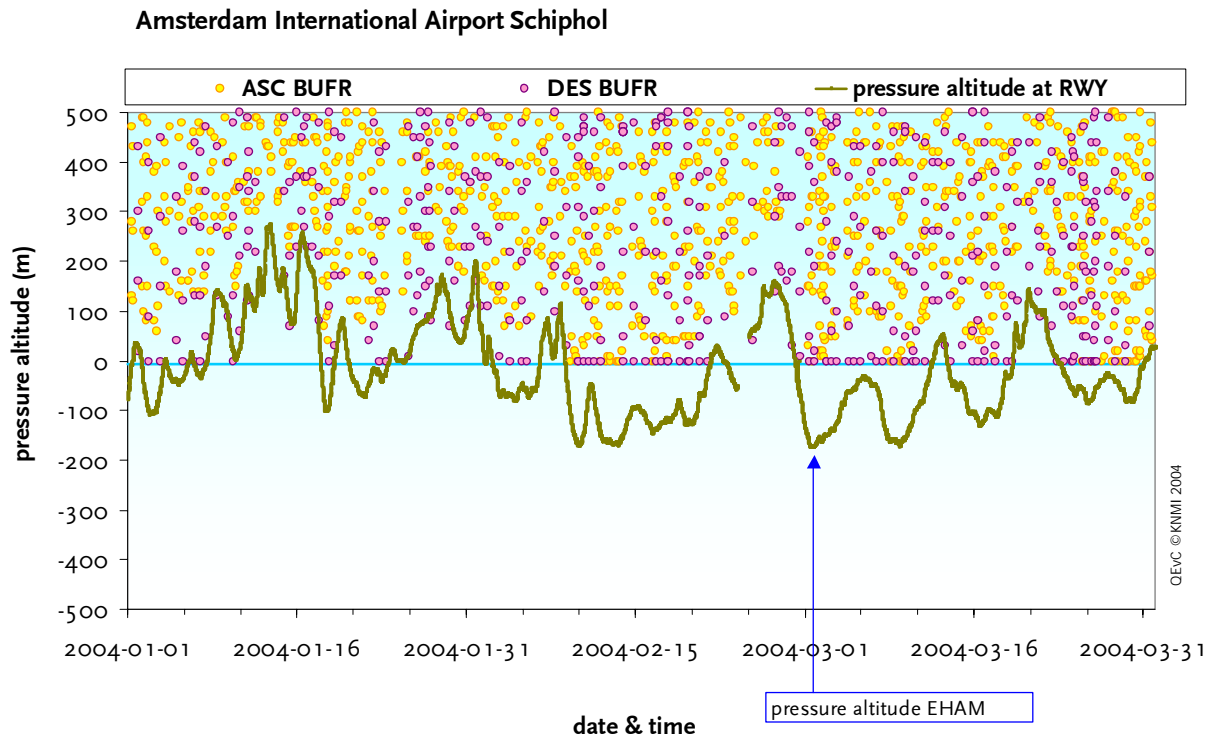


Fig. 2. BUFR encoded bulletins present observations for positive pressure altitudes only.

All these issues are under investigation by the E-AMNDAR TC, E-ADAS developers and airline contacts.

4) Monitoring results

a) Data Availability

AMNDAR reports are received via the different collecting centres with ground based receiving stations and consequently through GTS. Some aircraft fly "long haul" routes and where no ground station coverage available, send AMNDAR data via satellite communications systems. An overview for all aircraft involved is presented in [table 2](#). At the end of this table also a list of aircraft is presented for which more than three percent of the observations took more than two hours to arrive at the QEvC.

The total number of observations evaluated during the period is 2.393.212. The ten aircraft, which produced the highest number of observations, evaluated at QEvC, are presented in the following table:

no.	aircraft	amount	no.	aircraft	amount
1	EU6524	20881	6	EU4582	16020
2	EU0807	19742	7	EU0204	15784
3	EU0072	16893	8	EU5529	15746
4	EU0051	16801	9	EU0324	15491
5	EU1688	16055	10	EU6723	15402

More details on availability issues are presented in [table 3](#).

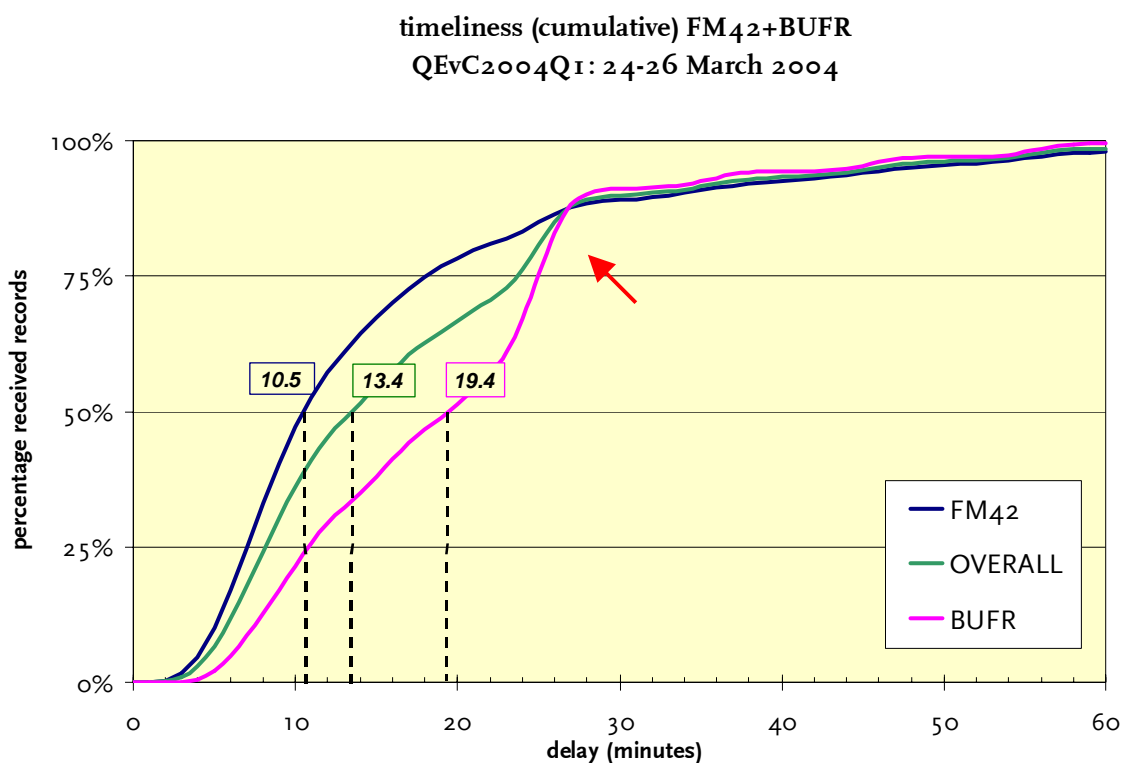
b) Data coverage

Aircraft carrying the AMDAR units fly prominently within Europe. To get a brief impression of the EU AMDAR coverage of Europe and the Atlantic two figures are presented in [Annex I](#).

c) Data Timeliness

The delay between observation and reception at the GTS nodes should be small. During the period, 98.1% of all reports were received within one hour of observation time and 98.7% within 2 hours from observation. Overall, the data timeliness is very good. This is demonstrated by figure 3. below, where from the cumulative frequency distribution it follows that 50% of all recorded observations is received within 13,4 minutes. Such figures present the delay in receiving a specific percentage of data and might be used for defining timeliness parameters as well (e.g. 98% levels).

Note, however, the difference between FM42 and BUFR encoded data with 50% values at 10,5 min. and 19,4 min. respectively. By considering the figure in more detail, an typical anomaly for BUFR encoded data at 30 minutes can be recognised. Such an anomaly can be explained by the assumption that some BUFR data is received within sets of bulletins every 30 minutes.

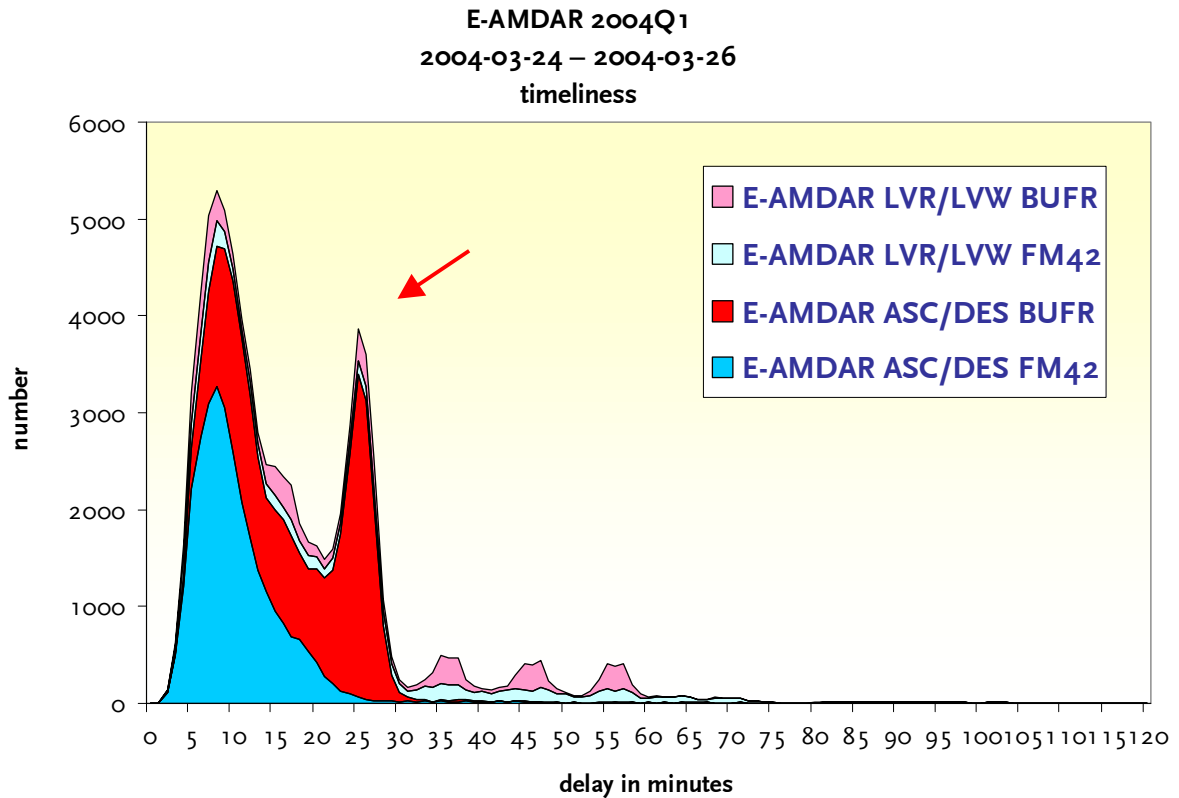


Figs. 3. Frequency distribution and cumulative frequency distribution for all FM42 and BUFR encoded EU-AMDAR observations during the period 24 - 26 March 2004 as a function of the interval between observation and time of reception. (Median values: FM42 encoded data: 10,5 min, BUFR encoded data: 19,4 min., overall result: 13,4 minutes). Note the typical curve for BUFR indicating an artificial ≈ 25 min. transmission delay policy for some data (see red arrow).

By considering this figure in more detail, an typical anomaly for BUFR encoded data at 0 and 25 minutes can be recognised. Such an anomaly can only be caused by an extra artificial

delay. Such a delay is usually caused within a transmission chain where two successive data buffers transmit sets of collected data at fixed, correlated timestamps.

Figure 4. demonstrates clearly the extreme low timeliness for ASC/DES data making AMDAR observations highly suitable as source for real-time profiles. The anomaly for BUFR data at around 25 min as shown in the previous figure is even better demonstrated here.



Figs. 4. Distribution for all FM42 and BUFR encoded EU-AMDAR observations during the period 24 - 26 March 2004 as a function of the interval between observation and time of reception (timeliness). By discriminating ascending/descending ASC/DEC data from flight level LVR/LVR (mainly long haul) the extreme low timeliness of less than 30 minutes for ASC/DES data is clearly demonstrated. Such a low timeliness is outmost important for generating real-time profiles. Note the very curious peak for BUFR ASC/DES data around 25 min (see arrow). Such a peak can only be due to an artificial delay caused by successive data buffers, transmitting datasets at fixed, correlated timestamps.

d) Frequency of reporting AMDAR observations

During level flight at cruising height the reporting frequency of AMDAR reports is expected to be one report per 7 minutes or 10 minutes depending on the Aircraft software. During the ascent or descent phase reports should be generated more frequently (*i.e.* every 50 hPa) with the higher frequency applying to the lower part of the atmosphere (*i.e.* every 10 hPa). It was found that the BUFR encoded AMDAR bulletins contain observations repeatedly done within one minute when in ascending or descending phase. As a consequence the reporting frequency of BUFR AMDARs is extremely high during that phase. Most of the aircraft operate within Europe and within relatively short travel distance.

e) Data quality evaluation

Every day quality control procedures are performed. By comparing the meteorological and positional information supplied by the AMDAR units with a reference background, suspect reports are selected and presented. FM42-IX and BUFR encoded AMDAR bulletins passing through the KNMI MSS are analysed for statistical evaluation purposes. Incorrectly encoded reports are stored apart and kept outside further evaluation.

The differences between observations and model-forecast fields from the HIRLAM-3 1-level-forecast-model are used for analysing the quality of AMDAR reports. These differences between the values from the observation and the model background (indicated by "O-B") are calculated for the levels from 950 to 400 hPa (ascent/descent levels) and for 350 to 150 hPa (cruise levels). Average values and standard deviations of the calculated differences for temperature, wind speed and wind direction are derived for all reports from any AMDAR unit separately and by taking into account time and place/position. For the evaluation process the most actual output from the HIRLAM model is used as reference. Note that this model has a 3 hours update interval. Consequently quality evaluation is performed every 3 hours. From this evaluation process AMDAR units are selected as an entry for identifying as a suspect report in case of overriding the stated criteria. As a result from this evaluation process a daily report is generated for direct transmission by e-mail to the E-AMDAR technical co-ordinator and all E-AMDAR operators. With the exception of rejected reports and of observations outside the HIRLAM area, **all** data is evaluated¹ and archived [see footnote]. However, for practical reasons, the daily reports present **only** those aircraft with identifiers starting with 'EU' (E-AMDAR), 'SVHZAP' (Middle East AMDAR) or ending on 'Z' (ASDAR).

Please note the "Middle East AMDAR", based on observations by Saudi aircraft, and started in 2004Q1. The QEvC monitoring programme is adaptable to include any additional airlines and a monitoring service can be supplied when aircraft is in the HIRLAM area (see [Annex I](#) - Figure 7.).

Criteria

The critical (absolute) margins used for selecting entries are:

- Air Temperature: $|T_A(O) - T_A(B)| \geq 0,5 \text{ °C (0,5 K)}$
- Wind speed: $|f(O) - f(B)| \geq 2,0 \text{ m/s } (\approx 4 \text{ Knots})$
- Wind direction: $|d(O) - d(B)| \geq 20 \text{ ° (Degrees)}$

No criterion is stated concerning standard deviations.

Biases and gross errors

The Obs-Background mean temperature differences vary between $-0,5 \text{ °C}$ and $+1,1 \text{ °C}$ (50% within $-0,1$ and $+0,35 \text{ °C}$). Aircraft with a mean difference, typically significant larger than expected are: EU0490 ($\Delta T = +4.5 \text{ °C}$), EU1976 ($\Delta T = +2.4 \text{ °C}$), EU2123 ($\Delta T = +2.2 \text{ °C}$), EU2473 ($\Delta T = +4.5 \text{ °C}$), EU2473 ($\Delta T = +2.6 \text{ °C}$) and EU2535 ($\Delta T = +5.1 \text{ °C}$) - almost identical to the previous quarter). (aircraft with *frequent* faults: EU1700, EU2673 and EU7864). For wind speed, aircraft EU1532 showed a mean difference, typically significant larger than expected. Aircraft exceeding the wind speed tolerances *frequently* are: EU0049 and EU0367. Aircraft exceeding the wind directions tolerances *frequently* are: EU0002, EU0021, EU0022, EU0041, EU0047 (same as in previous quarters!). For four aircraft the wind direction exceeded tolerances significantly *on average*: EU7635, EU1532, EU3544 and EU9729. In [Annex II](#), three figures are shown, presenting the frequency distribution of the mean O-B temperature differences, wind speed differences and wind direction differences as found for the set of aircraft.

¹ The E-AMDAR Technical Co-ordinator using other data sources evaluates aircraft outside the HIRLAM area.

For a number of observations extreme temperature differences were observed:

AIRCRAFT	Day	Time (UTC)	Latitude (°)	Longitude (°)	Altitude (m)	Temperature [observed] (°C)	Temperature [background] (°C)	Temperature difference (°C)
EU2405	2004-01-01	12:48	48.46	11.81	400	291.3	267.8	23.5
EU3421	2004-01-21	01:45	37.76	22.45	7620	258.0	234.5	23.5
EU4316	2004-02-16	23:08	49.77	9.55	11570	224.2	206.3	17.9
EU6564	2004-02-15	05:31	34.26	35.13	5480	258.5	239.6	18.9
EU7864	2004-02-24	01:35	50.05	8.57	110	290.7	269.5	21.2
EU8736	2004-01-02	10:29	49.00	2.60	730	293.2	270.3	22.9

Aircraft with *occasionally* extreme temperature differences ($\Delta T > 20$ K) are: EU1035, EU2405, EU3421, EU7864 and EU8736.

Remarkable wind speed differences were observed for:

AIRCRAFT	Day	Time (UTC)	Latitude (°)	Longitude (°)	Altitude (m)	Wind speed [observed] (m/s)	Wind speed [background] (m/s)	Wind speed difference (m/s)
EU3094	2004-01-01	01:27	27.70	2.50	11240	73.0	51.0	22.0
EU5463	2004-02-06	04:08	52.91	16.78	11580	77.2	56.2	21.0

Aircraft with occasionally *extreme* wind speed differences (> 20 m/s) are EU3094 and EU5463.

Occasionally wind direction differences of 90° or more are observed, even up to 180° , e.g.:

AIRCRAFT	Day	Time (UTC)	Latitude (°)	Longitude (°)	Altitude (m)	Wind direction [observed] (°)	Wind direction [background] (°)	Wind direction difference (°)
EU0021	2004-02-09	20:52	51.40	-0.40	30	65	245	180
EU0022	2004-01-25	16:17	53.30	-2.30	360	74	254	180
EU0023	2004-02-29	03:55	50.12	8.89	1240	22	202	180
EU0041	2004-03-09	18:39	45.47	9.30	360	74	252	178
EU0047	2004-01-05	10:44	40.30	-3.42	1440	81	262	179
EU0055	2004-03-15	12:30	36.90	10.20	2520	152	333	179
EU0059	2004-01-19	08:59	47.45	19.21	400	226	47	179
EU0061	2004-03-22	06:00	45.50	12.33	380	250	69	179
EU0081	2004-03-19	13:04	34.80	33.50	270	194	15	179

Aircraft with *extreme* wind direction differences are: **EU0002**, **EU0021**, **EU0022**, EU0023, **EU0041**, **EU0047**, EU0049, EU0055, EU0059, EU0061, EU0072, EU0081 and EU0301 (aircraft with frequent faults are in **bold**). An impression of the individual wind direction differences is given in figure 5., where a distribution is presented of $\langle |\Delta DD| \rangle$ ($=\text{AVG}(\text{ABS}(\text{DD_OBS} - \text{DD_MOD}))$):

**frequency of large wind direction differences
2004Q01**

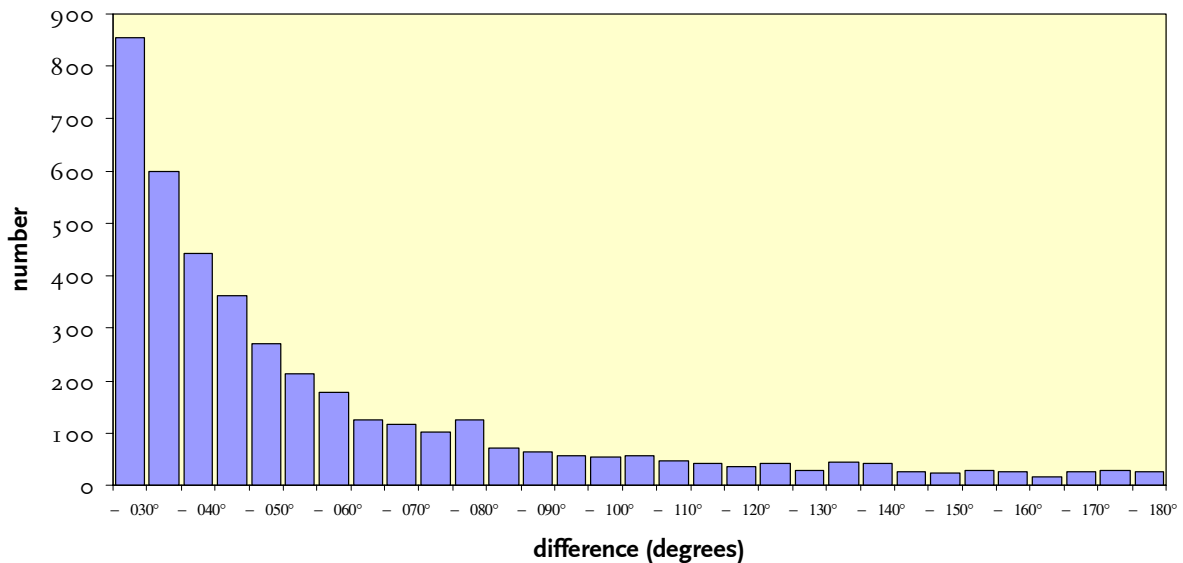


Fig. 5. Distribution for the individual O-B obs wind direction differences, $\langle |\Delta DD| \rangle$ as a function of pressure altitude. Note that for most of the observations it holds that $\langle |\Delta DD| \rangle < 30^\circ$, so this figure presents only a **very small** subset of the total amount of received data: i.e. 0,15 %.

f) Results (tables)

In the [tables 4 to 6](#) attached to this report **all** (EU-)AMDAR units are presented together with the observed total of average differences and standard deviations. All these tables are divided in two lists, one for the DES/ASC phase and the other for the cruise level phase. No statistics are presented for the UNS phase (unstable).

5) Outstanding identified anomalies.

The identified anomalies are to be considered by the Responsible Members. Reports from published detailed investigations on these issues will be summarised in the following quarterly report. Typical problems/faults (apart from routine maintenance) are presented in [table 3](#) (information provided by the appointed Technical Co-ordinator of the E-AMDAR Programme).

6) Solutions and actions taken from the previous period.

Errors or problems, traditionally mentioned in paragraph 3 are found to be accidentally and of minor importance only. Relevant issues are solved by direct contact between the appointed Technical Co-ordinator of the E-AMDAR Programme and the E-AMDAR operator(s).

7) Summary.

Timeliness and data quality: The number of anomalies is very low with respect to the total number of reports (95.2% within 45 min).

1. The number of aircraft reporting (EU-)AMDAR was **425**. The number of evaluated

observations was 2.393.212.

2. Since reports are generated automatically, in general, data is error free at the reception site.
3. Significant temperature, wind speed or wind direction anomalies were not found, except for the issues stated under par. 4.e. Overall, anomalies of $-0,10 - +0,35^{\circ}\text{C}$, $-0,05 - +0,29\text{ m/s}$, $\pm 6^{\circ}$ (for LVR/LVW) and $\pm 14^{\circ}$ (for ASC/DES) are typical (see [Annexes II and III](#)). These values are based on a 50% cumulative level score, i.e. 50% of all data are within these ranges.

8) Special case studies

a) Frequency distribution of the mean O–B differences

In [Annex II](#) of this report three figures are presented to indicate the frequency distribution of the mean O-B differences for temperature, wind speed and wind direction for the set of observing aircraft (N=425). In these figures distinction is made between observations in flight level (LVR/LVW) and observations during ascent or descent (ASC/DES). Note that only the absolute values of wind direction are analysed. Obviously differences (averaged over this quarter) vary within ranges of approx. $-0,6$ to $+1,2^{\circ}\text{C}$, $-0,2$ to $+0,6\text{m/s}$ and $\pm 9^{\circ}$ (for LVR/LVW) to $\pm 16^{\circ}$ (for ASC/DES) (to be considered as the *uncertainty* of observation).

b) Trends in the daily amount of observations

From January 1st to March 31st the amount of observations is registered on a daily base. In [Annex III](#) of this report the trend of this daily amount is presented. Obviously the number of received data is relatively stable for the whole period.

c) Trends in the mean O–B differences.

In [Annex IV](#) of this report the results of a case study on the trends in the mean O–B differences are presented for the individual aircraft.

d) The daily cycle and observation times.

In [Annex V](#) of this report four figures are presented, which gives a clear impression of AMDAR/ASDAR/AIREP data availability during a 24h cycle. In these figures (source: ECMWF) positional information is presented for the four main intervals of a day. Typically, very little E-AMDAR data are available around 00:00 UTC for the European region (mainly ASC/DES).

e) Case study on the frequency distribution of mean temperature differences by aircraft type

In [Annex VI](#) a case study is presented where the mean temperature differences are evaluated for each family of aircraft. It was found that the distributions are very comparable for most of the sets of aircraft. However a remarkable bias was found for subsets of aircraft of the A-320 family. Within this A-320 family, a typical difference between the sets of A-318/A-319/A-321 and of A-320 was observed as well.

Table 1, List of operational AMDAR units

(A: activated, D: deactivated during this quarter)

Identifier	Identifier	Identifier	Identifier	Identifier	Identifier
EU0002	EU0209	EU0575	EU1538	EU2530	EU3147
EU0006	EU0230	EU0576	EU1547	EU2532 A	EU3181
EU0007	EU0233	EU0583	EU1567	EU2559	EU3194
EU0021	EU0234	EU0601	EU1599	EU2590	EU3250
EU0022	EU0251	EU0620	EU1635	EU2595	EU3257
EU0023	EU0254	EU0631	EU1666	EU2610	EU3260
EU0032	EU0263	EU0676	EU1673	EU2618	EU3268
EU0034	EU0281	EU0707	EU1688	EU2622	EU3270
EU0041	EU0290	EU0711	EU1698	EU2627 A	EU3293
EU0043	EU0299	EU0723	EU1700	EU2630	EU3311
EU0046	EU0301	EU0734	EU1731	EU2673	EU3317
EU0047	EU0303	EU0802	EU1790	EU2690	EU3321
EU0049	EU0307	EU0807	EU1863	EU2717	EU3358
EU0051	EU0310	EU0810	EU1929	EU2751	EU3362
EU0052	EU0311	EU0826	EU2017	EU2752	EU3375
EU0054	EU0313	EU0875	EU2020	EU2773	EU3400
EU0055	EU0316	EU0921	EU2043	EU2792	EU3421
EU0059	EU0319	EU0942	EU2055	EU2794 A	EU3455
EU0060	EU0321	EU0999	EU2120	EU2795	EU3469
EU0061	EU0335	EU1001	EU2130	EU2800	EU3472
EU0072	EU0350	EU1012	EU2165	EU2829	EU3484
EU0073	EU0359	EU1035	EU2189	EU2845	EU3527
EU0078	EU0367	EU1054	EU2200	EU2846	EU3533
EU0080	EU0373	EU1056	EU2201	EU2883 A	EU3544
EU0081	EU0394	EU1232	EU2235	EU2897	EU3598
EU0082	EU0413	EU1234	EU2247	EU2905	EU3599
EU0086	EU0432	EU1261	EU2301	EU2912	EU3621
EU0106	EU0442	EU1282	EU2327	EU2936	EU3633
EU0109	EU0451	EU1301	EU2356	EU2978	EU3647
EU0110	EU0453	EU1312	EU2360	EU2979	EU3654
EU0120	EU0456	EU1320	EU2378	EU2983	EU3660
EU0124	EU0457	EU1334	EU2390	EU2984	EU3684
EU0140	EU0458	EU1337	EU2400 A	EU3000	EU3701
EU0154	EU0476	EU1346	EU2401	EU3042	EU3702
EU0158	EU0490	EU1411	EU2405	EU3048	EU3714
EU0167	EU0498	EU1437	EU2430	EU3075	EU3725
EU0185	EU0511	EU1446	EU2450 A	EU3094	EU3733
EU0202	EU0520	EU1456	EU2484 A	EU3096	EU3755
EU0204	EU0558	EU1498	EU2495	EU3114	EU3768
EU0206	EU0568	EU1532	EU2512	EU3115	EU3803

Identifier	Identifier	Identifier	Identifier	Identifier	Identifier
EU3824	EU4463	EU4950	EU5587	EU6893	EU8632
EU3845	EU4473	EU4954	EU5591	EU6900 A	EU8733
EU3854	EU4491	EU4956	EU5593	EU6923	EU8736
EU3855	EU4508	EU4976	EU5612	EU7001	EU8742
EU3874	EU4519	EU5050	EU5613	EU7082	EU8787
EU3908	EU4527	EU5073	EU5635	EU7119	EU8789
EU3953	EU4532	EU5098	EU5643	EU7218	EU8891
EU3961	EU4540	EU5129	EU5719	EU7285	EU8943
EU3972	EU4550	EU5134	EU5820	EU7293	EU8969
EU3992	EU4565	EU5141	EU5891	EU7314	EU9013
EU4002	EU4573	EU5167	EU6000	EU7382	EU9023
EU4004	EU4579	EU5175	EU6021 A	EU7412	EU9145
EU4021	EU4582	EU5182	EU6053	EU7427	EU9158
EU4035	EU4589	EU5185	EU6094	EU7521	EU9234
EU4066	EU4591	EU5191	EU6113 A	EU7536	EU9245
EU4075	EU4593	EU5245	EU6127 A	EU7548	EU9356
EU4083	EU4607	EU5261	EU6188 A	EU7610	EU9378
EU4112	EU4611	EU5264	EU6200 A	EU7629	EU9544
EU4137	EU4623	EU5318	EU6264	EU7634	EU9589
EU4169	EU4650	EU5331	EU6281	EU7635	EU9622
EU4172	EU4685	EU5349	EU6287	EU7643	EU9678
EU4205	EU4687	EU5351	EU6321	EU7654	EU9680
EU4235	EU4699	EU5360	EU6349	EU7724	EU9692
EU4264	EU4710	EU5372	EU6444	EU7864	EU9723
EU4278	EU4721	EU5387	EU6524	EU7865	EU9729
EU4300	EU4723	EU5397	EU6527	EU7866	EU9734
EU4316	EU4756	EU5420	EU6544	EU7888	EU9743
EU4321	EU4773	EU5429	EU6556	EU7894	EU9883
EU4333	EU4792	EU5435	EU6564	EU7910	EU9967
EU4387	EU4824	EU5441	EU6723	EU8264	
EU4392	EU4833	EU5478	EU6735	EU8431	
EU4400	EU4838	EU5486	EU6743	EU8478	
EU4426	EU4853	EU5511	EU6821	EU8520	
EU4444	EU4864	EU5529	EU6870 A	EU8598	
EU4450	EU4896	EU5544	EU6890	EU8605	

[444]



Table 2, Quantity and Timeliness of AMDAR Reports

Summary	
Number of days in this period	91
Number of aircraft reporting AMDAR	425
Number of E-AMDAR activated aircraft	444
Total number of observations evaluated during the period	2.393.212
Average daily number of aircraft reporting AMDAR	287 (65% of activated aircraft)
Percentage of data available within 60 minutes is	98.1 %
Percentage of data available within 120 minutes is	98.7 %
Average reports per day, per reporting aircraft is	92

Legend	
AIRCRAFT	Aircraft identifier
Total No of Reports	Number of reports received by E-AMDAR Quality Centre, exclusive of erroneous data.
Days of Reports	Number of days reports were received from aircraft by QEvC
Actual/possible	Ratio of Number of days aircraft reported/ maximum possible days in %
Average reports/day	Average number of reports per day of report from each aircraft
0 – 45 min	percentage of total reports received within 45 minutes of observation time
0 – 60 min	percentage of total reports received within 60 minutes of observation time
0 – 120 min	percentage of total reports received within 120 minutes of observation time

AIRCRAFT	Total No of Reports	Days of Reports	Actual/possible	Average reports/day	0–45 min	0–60 min	0–120 min
EU0002	6058	74	81%	82	100.0%	100.0%	100.0%
EU0006	2361	26	29%	91	83.0%	97.5%	98.8%
EU0021	14168	78	86%	182	100.0%	100.0%	100.0%
EU0022	13767	86	95%	160	100.0%	100.0%	100.0%
EU0023	2981	35	38%	85	76.1%	90.4%	93.3%
EU0032	5860	77	85%	76	100.0%	100.0%	100.0%
EU0041	8668	90	99%	96	89.7%	96.5%	98.0%
EU0042	257	9	10%	29	100.0%	100.0%	100.0%
EU0043	7529	86	95%	88	88.1%	94.6%	97.2%
EU0045	886	13	14%	68	100.0%	100.0%	100.0%
EU0046	2340	30	33%	78	84.6%	98.3%	99.2%
EU0047	9400	90	99%	104	90.9%	96.6%	98.2%
EU0049	5280	74	81%	71	100.0%	100.0%	100.0%
EU0051	16801	84	92%	200	100.0%	100.0%	100.0%
EU0054	9756	69	76%	141	100.0%	100.0%	100.0%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU0055	5323	62	68%	86	100.0%	100.0%	100.0%
EU0059	6903	83	91%	83	92.4%	95.6%	96.5%
EU0060	6589	43	47%	153	100.0%	100.0%	100.0%
EU0061	6269	82	90%	76	92.2%	95.5%	98.7%
EU0072	16893	87	96%	194	100.0%	100.0%	100.0%
EU0080	1680	26	29%	65	76.9%	94.7%	96.7%
EU0081	12542	89	98%	141	100.0%	100.0%	100.0%
EU0106	7654	85	93%	90	94.3%	97.8%	98.5%
EU0109	13790	89	98%	155	100.0%	100.0%	100.0%
EU0110	7793	70	77%	111	100.0%	100.0%	100.0%
EU0123	483	8	9%	60	100.0%	100.0%	100.0%
EU0124	5694	69	76%	83	100.0%	100.0%	100.0%
EU0140	2551	34	37%	75	78.4%	90.9%	92.1%
EU0158	6123	77	85%	80	92.8%	96.1%	96.4%
EU0167	6864	85	93%	81	90.7%	95.6%	96.3%
EU0185	6441	86	95%	75	91.6%	95.8%	96.7%
EU0202	7448	69	76%	108	100.0%	100.0%	100.0%
EU0204	15784	84	92%	188	100.0%	100.0%	100.0%
EU0206	2950	41	45%	72	82.3%	97.3%	98.6%
EU0230	2919	83	91%	35	100.0%	100.0%	100.0%
EU0233	2683	32	35%	84	81.5%	97.2%	98.4%
EU0234	5821	70	77%	83	99.3%	99.3%	100.0%
EU0251	7481	82	90%	91	93.9%	96.6%	96.8%
EU0263	3050	31	34%	98	100.0%	100.0%	100.0%
EU0290	3232	40	44%	81	77.8%	96.3%	97.0%
EU0299	4297	63	69%	68	100.0%	100.0%	100.0%
EU0301	6860	69	76%	99	89.6%	94.9%	97.2%
EU0303	6407	76	84%	84	92.5%	95.6%	96.4%
EU0307	6573	83	91%	79	95.8%	98.5%	99.1%
EU0310	9175	86	95%	107	100.0%	100.0%	100.0%
EU0311	5568	84	92%	66	92.3%	97.7%	98.1%
EU0313	6669	87	96%	77	90.6%	95.4%	97.6%
EU0316	8237	89	98%	93	88.8%	95.6%	97.0%
EU0319	8357	87	96%	96	87.7%	94.2%	96.1%
EU0324	15491	88	97%	176	100.0%	100.0%	100.0%
EU0335	3054	41	45%	74	74.5%	92.5%	95.0%
EU0350	1716	35	38%	49	74.6%	94.5%	95.5%
EU0359	4995	70	77%	71	93.7%	98.5%	98.5%
EU0367	5891	72	79%	82	99.2%	100.0%	100.0%
EU0373	6517	82	90%	79	94.6%	97.9%	98.5%
EU0394	2233	26	29%	86	97.1%	99.7%	99.7%
EU0413	7045	81	89%	87	91.2%	96.0%	97.4%
EU0432	5671	73	80%	78	100.0%	100.0%	100.0%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU0442	5530	72	79%	77	95.1%	98.1%	99.3%
EU0445	783	30	33%	26	100.0%	100.0%	100.0%
EU0451	2888	40	44%	72	71.3%	87.7%	92.8%
EU0453	8995	85	93%	106	100.0%	100.0%	100.0%
EU0456	4117	61	67%	67	94.1%	96.0%	96.2%
EU0457	4506	85	93%	53	100.0%	100.0%	100.0%
EU0458	4393	68	75%	65	97.1%	99.1%	99.2%
EU0476	2971	56	62%	53	96.5%	98.7%	98.7%
EU0490	626	17	19%	37	100.0%	100.0%	100.0%
EU0511	7330	86	95%	85	92.1%	96.4%	98.0%
EU0520	3057	44	48%	69	77.6%	95.3%	97.4%
EU0558	6292	85	93%	74	91.8%	95.0%	97.8%
EU0575	9384	87	96%	108	100.0%	100.0%	100.0%
EU0576	4388	53	58%	83	75.1%	94.0%	95.6%
EU0583	7310	85	93%	86	94.7%	98.2%	98.6%
EU0601	6420	78	86%	82	92.5%	96.1%	97.7%
EU0620	5540	66	73%	84	100.0%	100.0%	100.0%
EU0631	3732	55	60%	68	80.9%	97.3%	99.0%
EU0676	6637	80	88%	83	94.1%	97.0%	97.8%
EU0700	313	10	11%	31	100.0%	100.0%	100.0%
EU0707	4115	71	78%	58	100.0%	100.0%	100.0%
EU0720	1608	11	12%	146	100.0%	100.0%	100.0%
EU0802	5682	77	85%	74	91.2%	95.6%	98.5%
EU0807	19742	91	100%	217	100.0%	100.0%	100.0%
EU0810	6536	75	82%	87	96.2%	98.4%	98.8%
EU0830	48	4	4%	12	100.0%	100.0%	100.0%
EU0875	5804	83	91%	70	91.0%	95.5%	96.8%
EU0902	115	13	14%	9	100.0%	100.0%	100.0%
EU0921	6733	78	86%	86	94.4%	98.3%	98.9%
EU0942	2137	31	34%	69	77.2%	93.7%	94.9%
EU0947	1822	25	27%	73	100.0%	100.0%	100.0%
EU0970	608	19	21%	32	100.0%	100.0%	100.0%
EU1001	6193	76	84%	81	99.2%	99.2%	100.0%
EU1012	1828	25	27%	73	78.3%	98.6%	99.6%
EU1035	2543	34	37%	75	77.6%	97.8%	98.2%
EU1054	3142	42	46%	75	76.0%	96.6%	98.6%
EU1056	3883	70	77%	55	100.0%	100.0%	100.0%
EU1115	1357	36	40%	38	100.0%	100.0%	100.0%
EU1230	216	18	20%	12	100.0%	100.0%	100.0%
EU1232	2141	31	34%	69	77.5%	95.9%	98.4%
EU1234	7323	83	91%	88	92.3%	96.2%	97.0%
EU1259	877	24	26%	37	100.0%	100.0%	100.0%
EU1282	6787	84	92%	81	100.0%	100.0%	100.0%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU1301	14523	90	99%	161	100.0%	100.0%	100.0%
EU1312	7188	43	47%	167	100.0%	100.0%	100.0%
EU1320	3184	49	54%	65	79.0%	98.3%	99.1%
EU1334	5516	82	90%	67	100.0%	100.0%	100.0%
EU1337	1037	14	15%	74	95.8%	100.0%	100.0%
EU1345	507	18	20%	28	100.0%	100.0%	100.0%
EU1346	2754	39	43%	71	76.0%	95.5%	98.0%
EU1367	61	8	9%	8	100.0%	100.0%	100.0%
EU1411	3195	74	81%	43	100.0%	100.0%	100.0%
EU1436	459	16	18%	29	100.0%	100.0%	100.0%
EU1437	2891	43	47%	67	75.7%	94.1%	97.8%
EU1498	7537	88	97%	86	94.7%	98.0%	98.2%
EU1532	43	1	1%	43	100.0%	100.0%	100.0%
EU1538	2828	36	40%	79	79.1%	95.8%	97.2%
EU1547	6928	84	92%	82	91.3%	95.1%	96.2%
EU1567	5395	67	74%	81	100.0%	100.0%	100.0%
EU1593	3015	29	32%	104	100.0%	100.0%	100.0%
EU1599	3375	42	46%	80	83.3%	98.2%	98.8%
EU1635	3361	40	44%	84	81.5%	97.7%	99.2%
EU1666	2917	40	44%	73	78.0%	95.0%	97.0%
EU1673	11208	61	67%	184	100.0%	100.0%	100.0%
EU1688	16055	88	97%	182	100.0%	100.0%	100.0%
EU1698	5346	62	68%	86	99.1%	99.1%	100.0%
EU1700	2311	30	33%	77	80.6%	96.0%	97.4%
EU1731	2411	28	31%	86	78.5%	90.8%	93.8%
EU1790	12687	87	96%	146	100.0%	100.0%	100.0%
EU1800	7210	84	92%	86	94.4%	96.2%	97.6%
EU1929	3245	73	80%	44	100.0%	100.0%	100.0%
EU1976	377	15	16%	25	100.0%	100.0%	100.0%
EU2017	4711	64	70%	74	91.2%	95.2%	97.8%
EU2020	7611	86	95%	89	94.7%	96.3%	98.6%
EU2043	6213	71	78%	88	100.0%	100.0%	100.0%
EU2055	3957	54	59%	73	93.5%	97.8%	98.1%
EU2120	6516	69	76%	94	93.2%	95.3%	98.0%
EU2123	92	2	2%	46	100.0%	100.0%	100.0%
EU2165	7343	84	92%	87	93.5%	96.9%	97.5%
EU2189	6441	84	92%	77	91.9%	96.5%	97.9%
EU2200	7809	76	84%	103	100.0%	100.0%	100.0%
EU2201	6275	83	91%	76	93.1%	97.1%	97.6%
EU2235	8631	87	96%	99	92.0%	93.6%	97.2%
EU2247	6497	80	88%	81	93.9%	97.4%	98.4%
EU2276	993	33	36%	30	100.0%	100.0%	100.0%
EU2301	7195	83	91%	87	91.5%	96.6%	97.5%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU2356	1153	25	27%	46	82.6%	99.3%	100.0%
EU2360	7663	78	86%	98	93.6%	95.5%	97.6%
EU2378	2883	63	69%	46	100.0%	100.0%	100.0%
EU2390	5763	72	79%	80	100.0%	100.0%	100.0%
EU2400	4427	72	79%	61	100.0%	100.0%	100.0%
EU2405	9277	83	91%	112	97.6%	98.1%	98.6%
EU2407	202	19	21%	11	100.0%	100.0%	100.0%
EU2429	526	22	24%	24	100.0%	100.0%	100.0%
EU2450	3817	66	73%	58	100.0%	100.0%	100.0%
EU2454	482	14	15%	34	100.0%	100.0%	100.0%
EU2473	66	5	5%	13	100.0%	100.0%	100.0%
EU2491	143	7	8%	20	100.0%	100.0%	100.0%
EU2495	6756	66	73%	102	97.2%	97.9%	98.5%
EU2512	6275	48	53%	131	94.7%	96.1%	97.0%
EU2532	3697	66	73%	56	100.0%	100.0%	100.0%
EU2535	25	2	2%	13	100.0%	100.0%	100.0%
EU2559	7572	81	89%	93	90.9%	96.2%	97.3%
EU2595	3989	40	44%	100	88.0%	95.5%	96.8%
EU2610	4723	47	52%	100	89.5%	98.4%	99.3%
EU2622	7378	82	90%	90	96.5%	97.3%	97.4%
EU2627	3200	57	63%	56	100.0%	100.0%	100.0%
EU2630	4471	62	68%	72	100.0%	100.0%	100.0%
EU2673	1812	24	26%	76	84.9%	96.0%	97.6%
EU2690	9011	85	93%	106	94.0%	95.0%	96.3%
EU2717	8651	82	90%	106	98.0%	98.4%	98.4%
EU2751	14716	87	96%	169	100.0%	100.0%	100.0%
EU2752	10511	87	96%	121	96.7%	97.3%	98.3%
EU2773	4432	78	86%	57	100.0%	100.0%	100.0%
EU2792	9828	87	96%	113	96.2%	97.1%	97.5%
EU2794	2960	53	58%	56	100.0%	100.0%	100.0%
EU2795	4227	84	92%	50	100.0%	100.0%	100.0%
EU2800	10077	84	92%	120	97.5%	97.7%	98.6%
EU2829	6653	82	90%	81	94.8%	96.0%	96.4%
EU2845	4039	69	76%	59	100.0%	100.0%	100.0%
EU2846	9863	86	95%	115	94.2%	95.2%	96.3%
EU2883	2950	52	57%	57	98.5%	98.5%	100.0%
EU2897	7877	84	92%	94	97.5%	98.0%	98.5%
EU2905	4670	43	47%	109	95.1%	96.5%	98.5%
EU2912	13332	89	98%	150	100.0%	100.0%	100.0%
EU2936	7437	78	86%	95	93.2%	95.0%	95.8%
EU2979	8562	90	99%	95	94.3%	96.8%	97.8%
EU2983	7479	83	91%	90	94.8%	96.6%	98.1%
EU2984	4234	47	52%	90	100.0%	100.0%	100.0%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU3000	6450	79	87%	82	92.9%	96.7%	97.4%
EU3042	6458	81	89%	80	93.8%	96.7%	96.8%
EU3048	6758	81	89%	83	93.5%	95.9%	97.6%
EU3075	4554	80	88%	57	100.0%	100.0%	100.0%
EU3094	7054	75	82%	94	100.0%	100.0%	100.0%
EU3096	7806	84	92%	93	95.6%	97.5%	98.4%
EU3113	83	9	10%	9	100.0%	100.0%	100.0%
EU3114	8298	86	95%	96	94.0%	95.7%	98.0%
EU3115	8422	83	91%	101	94.5%	97.1%	98.5%
EU3125	724	24	26%	30	100.0%	100.0%	100.0%
EU3147	4009	77	85%	52	100.0%	100.0%	100.0%
EU3169	295	16	18%	18	100.0%	100.0%	100.0%
EU3181	128	8	9%	16	100.0%	100.0%	100.0%
EU3194	7465	80	88%	93	92.8%	95.1%	97.2%
EU3201	8171	86	95%	95	93.2%	95.1%	96.9%
EU3250	7835	84	92%	93	92.6%	94.3%	96.9%
EU3257	7148	88	97%	81	93.2%	96.8%	97.1%
EU3260	6763	84	92%	81	92.6%	94.2%	97.0%
EU3265	3308	69	76%	48	100.0%	100.0%	100.0%
EU3268	4227	50	55%	85	100.0%	100.0%	100.0%
EU3270	6190	75	82%	83	100.0%	100.0%	100.0%
EU3293	7789	85	93%	92	93.6%	94.9%	96.9%
EU3311	4332	46	51%	94	93.2%	95.5%	95.6%
EU3317	6288	72	79%	87	95.2%	97.1%	97.7%
EU3321	5515	68	75%	81	100.0%	100.0%	100.0%
EU3358	5611	67	74%	84	99.1%	99.1%	100.0%
EU3362	7665	87	96%	88	96.0%	98.0%	98.6%
EU3375	6976	83	91%	84	93.0%	94.7%	96.4%
EU3400	7023	73	80%	96	94.4%	96.7%	96.9%
EU3421	7848	81	89%	97	89.6%	96.4%	98.5%
EU3455	8357	85	93%	98	92.1%	95.2%	96.7%
EU3469	5655	78	86%	73	100.0%	100.0%	100.0%
EU3472	7287	77	85%	95	94.8%	97.3%	97.9%
EU3484	8976	83	91%	108	95.8%	97.8%	98.2%
EU3527	7226	67	74%	108	95.8%	97.9%	98.5%
EU3544	266	4	4%	67	87.2%	97.7%	100.0%
EU3598	4098	75	82%	55	97.0%	98.3%	98.3%
EU3599	4595	78	86%	59	98.2%	98.9%	99.9%
EU3621	5495	76	84%	72	100.0%	100.0%	100.0%
EU3633	4183	61	67%	69	81.5%	93.1%	94.4%
EU3647	6114	63	69%	97	94.6%	97.9%	97.9%
EU3654	8546	83	91%	103	100.0%	100.0%	100.0%
EU3660	3999	47	52%	85	82.5%	95.9%	98.1%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU3701	3786	40	44%	95	85.0%	96.2%	96.7%
EU3703	2511	61	67%	41	100.0%	100.0%	100.0%
EU3714	6651	70	77%	95	100.0%	100.0%	100.0%
EU3725	3633	53	58%	69	100.0%	100.0%	100.0%
EU3733	3205	41	45%	78	83.5%	95.8%	96.9%
EU3747	107	15	16%	7	100.0%	100.0%	100.0%
EU3755	2689	36	40%	75	100.0%	100.0%	100.0%
EU3768	4345	46	51%	94	82.9%	95.4%	98.1%
EU3769	625	23	25%	27	100.0%	100.0%	100.0%
EU3781	435	40	44%	11	100.0%	100.0%	100.0%
EU3815	860	26	29%	33	100.0%	100.0%	100.0%
EU3824	5408	59	65%	92	86.0%	96.8%	98.1%
EU3837	310	15	16%	21	100.0%	100.0%	100.0%
EU3859	433	17	19%	25	100.0%	100.0%	100.0%
EU3874	3879	75	82%	52	100.0%	100.0%	100.0%
EU3908	13223	77	85%	172	100.0%	100.0%	100.0%
EU3953	5314	49	54%	108	83.7%	93.6%	95.6%
EU3961	1513	11	12%	138	85.7%	96.2%	99.0%
EU3972	3637	59	65%	62	98.7%	98.7%	100.0%
EU3992	2874	35	38%	82	85.2%	97.9%	98.4%
EU4002	5318	70	77%	76	100.0%	100.0%	100.0%
EU4004	2034	27	30%	75	80.9%	93.4%	94.8%
EU4021	5202	68	75%	77	100.0%	100.0%	100.0%
EU4035	1075	14	15%	77	78.3%	99.7%	100.0%
EU4066	2750	29	32%	95	86.6%	98.2%	98.9%
EU4075	12178	81	89%	150	100.0%	100.0%	100.0%
EU4083	5207	53	58%	98	82.0%	94.0%	96.9%
EU4112	3108	42	46%	74	79.0%	94.8%	95.9%
EU4137	2050	41	45%	50	78.9%	95.8%	98.5%
EU4169	2620	28	31%	94	85.8%	99.4%	99.9%
EU4172	1995	41	45%	49	81.2%	96.6%	97.5%
EU4205	3058	56	62%	55	78.6%	96.5%	97.5%
EU4235	2515	43	47%	58	80.1%	94.6%	96.2%
EU4264	5379	58	64%	93	84.4%	95.5%	98.0%
EU4278	5687	73	80%	78	99.2%	99.2%	100.0%
EU4300	3165	52	57%	61	81.6%	97.7%	99.7%
EU4316	5761	57	63%	101	87.1%	97.6%	98.2%
EU4321	6468	64	70%	101	83.7%	95.5%	96.8%
EU4387	3392	71	78%	48	100.0%	100.0%	100.0%
EU4392	5859	54	59%	109	87.5%	96.4%	97.5%
EU4426	13057	84	92%	155	100.0%	100.0%	100.0%
EU4444	10745	87	96%	124	100.0%	100.0%	100.0%
EU4450	5530	57	63%	97	85.6%	95.5%	97.9%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU4463	2659	45	49%	59	98.2%	98.2%	98.2%
EU4473	4666	51	56%	91	88.6%	98.5%	99.5%
EU4491	3585	55	60%	65	100.0%	100.0%	100.0%
EU4508	5262	53	58%	99	85.5%	96.4%	97.1%
EU4519	8759	78	86%	112	100.0%	100.0%	100.0%
EU4532	2602	45	49%	58	95.9%	97.4%	98.7%
EU4540	6051	67	74%	90	95.2%	97.9%	98.6%
EU4565	4270	72	79%	59	99.1%	100.0%	100.0%
EU4573	13731	82	90%	167	100.0%	100.0%	100.0%
EU4579	8956	86	95%	104	92.8%	95.8%	97.0%
EU4582	16020	87	96%	184	100.0%	100.0%	100.0%
EU4589	667	16	18%	42	100.0%	100.0%	100.0%
EU4591	9326	82	90%	114	100.0%	100.0%	100.0%
EU4593	7583	88	97%	86	90.0%	96.0%	97.8%
EU4607	9162	83	91%	110	100.0%	100.0%	100.0%
EU4623	8641	86	95%	100	93.7%	96.6%	97.9%
EU4650	7933	86	95%	92	94.5%	96.9%	97.8%
EU4685	7456	69	76%	108	100.0%	100.0%	100.0%
EU4687	9147	90	99%	102	93.3%	96.4%	97.0%
EU4710	6769	77	85%	88	95.7%	98.8%	99.4%
EU4721	4605	49	54%	94	100.0%	100.0%	100.0%
EU4723	6765	69	76%	98	93.6%	96.5%	97.2%
EU4773	1036	12	13%	86	93.8%	96.0%	96.2%
EU4792	4416	60	66%	74	100.0%	100.0%	100.0%
EU4824	7357	78	86%	94	93.2%	95.8%	96.3%
EU4833	8183	81	89%	101	94.3%	97.5%	97.8%
EU4838	5060	60	66%	84	99.1%	99.1%	100.0%
EU4853	9802	81	89%	121	100.0%	100.0%	100.0%
EU4864	8385	85	93%	99	93.1%	96.0%	97.4%
EU4950	5160	67	74%	77	100.0%	100.0%	100.0%
EU4954	7762	81	89%	96	93.8%	97.4%	97.8%
EU4976	7338	79	87%	93	92.6%	95.5%	96.7%
EU5050	7616	81	89%	94	94.3%	96.6%	97.7%
EU5073	9133	88	97%	104	94.6%	97.2%	97.9%
EU5098	4988	59	65%	85	100.0%	100.0%	100.0%
EU5129	9415	88	97%	107	100.0%	100.0%	100.0%
EU5134	167	10	11%	17	100.0%	100.0%	100.0%
EU5182	646	7	8%	92	100.0%	100.0%	100.0%
EU5185	8571	83	91%	103	94.4%	96.8%	97.6%
EU5261	9085	89	98%	102	94.1%	96.8%	97.3%
EU5264	7490	86	95%	87	96.0%	98.9%	99.0%
EU5318	6541	86	95%	76	94.4%	97.6%	97.9%
EU5331	7062	83	91%	85	91.9%	97.5%	98.3%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU5349	5488	68	75%	81	100.0%	100.0%	100.0%
EU5351	6514	87	96%	75	89.8%	94.9%	97.0%
EU5397	8449	81	89%	104	100.0%	100.0%	100.0%
EU5420	4475	57	63%	79	83.7%	96.4%	97.0%
EU5429	13930	90	99%	155	100.0%	100.0%	100.0%
EU5435	6062	84	92%	72	92.1%	96.3%	97.0%
EU5441	4691	66	73%	71	86.8%	95.8%	98.6%
EU5463	6081	56	62%	109	85.8%	98.2%	98.8%
EU5478	14475	86	95%	168	100.0%	100.0%	100.0%
EU5486	3584	38	42%	94	87.3%	98.7%	99.5%
EU5511	4779	43	47%	111	84.6%	95.0%	96.4%
EU5529	15746	85	93%	185	100.0%	100.0%	100.0%
EU5544	9667	77	85%	126	88.2%	97.8%	98.4%
EU5587	6036	82	90%	74	92.6%	96.8%	97.7%
EU5591	13090	78	86%	168	100.0%	100.0%	100.0%
EU5593	2949	51	56%	58	100.0%	100.0%	100.0%
EU5601	3745	74	81%	51	100.0%	100.0%	100.0%
EU5612	7816	83	91%	94	100.0%	100.0%	100.0%
EU5613	6398	85	93%	75	91.7%	97.0%	97.6%
EU5635	8438	73	80%	116	86.3%	95.5%	97.0%
EU5643	7817	43	47%	182	100.0%	100.0%	100.0%
EU5719	1692	22	24%	77	80.2%	96.4%	97.6%
EU5820	1277	17	19%	75	78.3%	91.2%	94.7%
EU5891	6188	86	95%	72	89.6%	93.6%	94.7%
EU6000	3811	58	64%	66	96.1%	97.0%	98.0%
EU6021	7186	60	66%	120	82.3%	97.1%	98.4%
EU6053	4691	43	47%	109	79.4%	93.1%	95.3%
EU6094	4258	38	42%	112	81.6%	96.2%	97.1%
EU6113	4945	50	55%	99	100.0%	100.0%	100.0%
EU6127	5360	49	54%	109	82.4%	96.7%	98.0%
EU6148	2958	25	27%	118	83.4%	97.8%	99.5%
EU6188	2736	25	27%	109	80.3%	94.4%	95.2%
EU6200	473	5	5%	95	83.7%	100.0%	100.0%
EU6264	9976	87	96%	115	100.0%	100.0%	100.0%
EU6287	5134	66	73%	78	99.2%	100.0%	100.0%
EU6349	3852	58	64%	66	100.0%	100.0%	100.0%
EU6386	14680	90	99%	163	100.0%	100.0%	100.0%
EU6444	6848	65	71%	105	100.0%	100.0%	100.0%
EU6524	20881	91	100%	229	100.0%	100.0%	100.0%
EU6527	4814	67	74%	72	100.0%	100.0%	100.0%
EU6544	8392	89	98%	94	91.0%	96.0%	98.2%
EU6556	7003	87	96%	80	88.6%	94.8%	97.5%
EU6564	8611	88	97%	98	91.1%	96.8%	97.7%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/ possible	Average reports/ day	0–45 min	0–60 min	0–120 min
EU6723	15402	85	93%	181	100.0%	100.0%	100.0%
EU6735	7715	84	92%	92	89.4%	95.3%	96.7%
EU6743	6118	86	95%	71	94.2%	98.4%	98.6%
EU6870	1983	10	11%	198	92.5%	99.7%	100.0%
EU6890	3956	66	73%	60	100.0%	100.0%	100.0%
EU6900	133	1	1%	133	93.8%	100.0%	100.0%
EU6923	5329	76	84%	70	99.3%	99.3%	100.0%
EU7001	4527	60	66%	75	90.3%	94.4%	95.0%
EU7082	4937	73	80%	68	100.0%	100.0%	100.0%
EU7119	3378	66	73%	51	95.5%	97.5%	97.7%
EU7218	4502	64	70%	70	100.0%	100.0%	100.0%
EU7285	4778	63	69%	76	100.0%	100.0%	100.0%
EU7293	5481	77	85%	71	91.0%	96.3%	97.1%
EU7314	6912	85	93%	81	93.1%	98.6%	98.8%
EU7382	6605	83	91%	80	93.1%	98.1%	98.8%
EU7412	6817	85	93%	80	92.1%	98.0%	98.3%
EU7427	7293	88	97%	83	90.4%	95.9%	96.7%
EU7521	5700	73	80%	78	100.0%	100.0%	100.0%
EU7536	5708	84	92%	68	90.0%	94.6%	97.1%
EU7610	9052	87	96%	104	92.6%	94.7%	95.5%
EU7629	4435	63	69%	70	100.0%	100.0%	100.0%
EU7634	4761	62	68%	77	99.0%	100.0%	100.0%
EU7635	697	12	13%	58	90.5%	98.7%	99.3%
EU7643	4538	63	69%	72	100.0%	100.0%	100.0%
EU7654	3017	53	58%	57	100.0%	100.0%	100.0%
EU7724	5350	61	67%	88	100.0%	100.0%	100.0%
EU7864	3658	42	46%	87	79.2%	97.2%	99.3%
EU7865	4995	68	75%	73	100.0%	100.0%	100.0%
EU7866	5386	73	80%	74	100.0%	100.0%	100.0%
EU7888	9376	81	89%	116	100.0%	100.0%	100.0%
EU7894	4621	70	77%	66	98.0%	99.2%	99.9%
EU7910	7822	88	97%	89	92.4%	95.3%	97.0%
EU8264	3326	49	54%	68	100.0%	100.0%	100.0%
EU8431	5252	67	74%	78	100.0%	100.0%	100.0%
EU8478	4443	64	70%	69	100.0%	100.0%	100.0%
EU8520	3827	47	52%	81	100.0%	100.0%	100.0%
EU8598	1398	20	22%	70	100.0%	100.0%	100.0%
EU8605	4903	66	73%	74	100.0%	100.0%	100.0%
EU8632	6429	76	84%	85	99.2%	99.2%	100.0%
EU8733	7879	86	95%	92	89.3%	95.0%	97.1%
EU8736	1039	15	16%	69	100.0%	100.0%	100.0%
EU8742	7667	86	95%	89	87.1%	94.2%	97.0%
EU8787	6308	86	95%	73	91.7%	95.3%	96.0%

AIRCRAFT	Total No of Reports	Days of Reports	Actual/possible	Average reports/day	0–45 min	0–60 min	0–120 min
EU8789	2520	38	42%	66	96.2%	96.2%	100.0%
EU8891	4303	62	68%	69	100.0%	100.0%	100.0%
EU8943	5713	61	67%	94	100.0%	100.0%	100.0%
EU8969	4020	53	58%	76	100.0%	100.0%	100.0%
EU9013	7213	86	95%	84	92.9%	97.7%	98.0%
EU9023	4005	56	62%	72	100.0%	100.0%	100.0%
EU9145	5546	66	73%	84	100.0%	100.0%	100.0%
EU9158	13147	78	86%	169	100.0%	100.0%	100.0%
EU9234	351	4	4%	88	100.0%	100.0%	100.0%
EU9245	1591	20	22%	80	100.0%	100.0%	100.0%
EU9356	6096	78	86%	78	100.0%	100.0%	100.0%
EU9378	3660	49	54%	75	100.0%	100.0%	100.0%
EU9544	5535	35	38%	158	100.0%	100.0%	100.0%
EU9622	9857	82	90%	120	100.0%	100.0%	100.0%
EU9678	5200	71	78%	73	100.0%	100.0%	100.0%
EU9680	3396	44	48%	77	100.0%	100.0%	100.0%
EU9692	5028	69	76%	73	100.0%	100.0%	100.0%
EU9723	6180	84	92%	74	93.7%	97.4%	97.8%
EU9729	4780	53	58%	90	100.0%	100.0%	100.0%
EU9734	3412	50	55%	68	98.6%	98.6%	98.6%
EU9743	15094	84	92%	180	100.0%	100.0%	100.0%
EU9883	6217	86	95%	72	91.9%	96.7%	97.7%
EU9967	3553	55	60%	65	99.0%	99.0%	100.0%

[425]

- *Timeliness: From 20 aircraft more than 4% of the received data had on average a delay after observation for more than two hours.*

Identifier	Identifier	Identifier	Identifier	Identifier
EU0023	EU0451	EU2936	EU4004	EU6053
EU0140	EU0576	EU3311	EU4112	EU6188
EU0335	EU0942	EU3633	EU5820	EU7001
EU0350	EU1731	EU3953	EU5891	EU7610

Note that a number of aircraft fly long haul routes and either “store” data until reaching a Ground Receiving Station or use Satcom – which would account for some delay. For 132 aircraft more than 2% of the data was received after a delay of 2 hours or more.

- *No data was received from the following 63 aircraft (*: not reporting due to budgetary constraints.)*

Identifier	Identifier	Identifier	Identifier	Identifier	Identifier
EU0007	EU0073	EU0086	EU0209	EU0321	EU0711 *
EU0034 *	EU0078	EU0120	EU0254	EU0498	EU0723
EU0052	EU0082	EU0154	EU0281 *	EU0568 *	EU0734

Identifier	Identifier	Identifier	Identifier	Identifier	Identifier
EU0826 *	EU2401	EU3684	EU4527	EU5167	EU6321 *
EU0999	EU2430 *	EU3702	EU4550	EU5175 *	EU6821 *
EU1261 *	EU2484	EU3803	EU4611	EU5191 *	EU6893
EU1446 *	EU2530 *	EU3845	EU4699	EU5245 *	EU7548
EU1456	EU2590	EU3854	EU4756 *	EU5360	EU9589
EU1863	EU2618	EU3855	EU4896 *	EU5372	
EU2130	EU2978	EU4333	EU4956 *	EU5387	
EU2327 *	EU3533	EU4400	EU5141	EU6281	

The gradual increase in this figure during the last year is in some part a reflection on the economic situation with the E-AMDAR participating airlines - temporary grounding of aircraft and some reductions to routes flown.

- Although *de-activated* or *to-be-activated*, data was received unexpectedly from the following 44 aircraft (*: Operator informs that aircraft may report occasionally)

Identifier	Identifier	Identifier	Identifier	Identifier	Identifier
EU0042	EU0720	EU1230	EU1800	EU2454	EU3169
EU0045*	EU0830	EU1259	EU1976	EU2473	EU3201
EU0123*	EU0902	EU1345	EU2123	EU2491	EU3265
EU0324	EU0947*	EU1367	EU2276	EU2535	EU3703
EU0445	EU0970	EU1436	EU2407	EU3113	EU3747
EU0700	EU1115	EU1593*	EU2429	EU3125	

Table 3, Description and number of errors

Aircraft with parameter anomalies:

Aircraft deactivated due to temperature anomalies

- EU0490: temp error still evident disabled on EADAS Jan 12th
- EU8736: temp bias, aircraft deactivated by operator Jan 23rd
- EU0359: temp error Jan 6th – sensor changed and reporting again Jan 16th Error returned Jan 20th disabled by operator
- EU1261: temp error (aircraft disabled Nov 4th.) Error still evident aircraft not due for maintenance.
- EU2378: large temp bias – aircraft disabled by operator Mar 16th

Consistent warm bias (monthly mean diff > 1.0°C)

- January 2004:
EU0041, EU0047, EU0316, EU0359, EU0490, EU0830, EU1230, EU1259, EU1436, EU1976, EU2473, EU2535, EU3421, EU3859, EU4112, EU4593, EU5050, EU5331, EU6544, EU7293, EU7412, EU7427, EU8736.
- February 2004:
EU0041, EU0047, EU0316, EU0359, EU0490, EU1259, EU2429, EU3042, EU3421, EU3781, EU4112, EU4593, EU5050, EU5331, EU6544, EU7293, EU7412, EU8742.
- March 2004:
EU0047, EU0316, EU3421, EU3599, EU3781, EU4112, EU4593, EU5050, EU5435, EU6544, EU7293, EU7412, EU8742.

Warm bias (mean diff > 1.0°C on 5 or more days)

- January 2004:
EU0072, EU0158, EU0167, EU0313, EU0476, EU0875, EU1115, EU2020, EU2189, EU2491, EU2559, EU3042, EU3115, EU3125, EU3362, EU3559, EU3781, EU4532, EU5134, EU5397, EU5435, EU5891, EU6735, EU6923, EU7119, EU7382, EU8742, EU8787, EU9723, EU9883.
- February 2004:
EU0081, EU0158, EU0167, EU0185, EU0204, EU0311, EU0313, EU0458, EU0875, EU1929, EU2020, EU2189, EU2301, EU3599, EU3824, EU4532, EU5435, EU5891, EU6735, EU7382, EU7427, EU8787, EU9723, EU9883.
- March 2004:
EU0041, EU0313, EU0359, EU0445, EU0456, EU0875, EU2020, EU2189, EU2301, EU2405, EU2559, EU2795, EU3042, EU3362, EU3598, EU3703, EU3824, EU4083, EU4582, EU5331, EU5891, EU6000, EU7001, EU7427, EU8787, EU9723

No reports received although expected:

- EU0006: No reports Jan 1 – 25th, Feb 12 – 29th
- EU0021: No reports Feb 15 – 25th
- EU0023: No reports Mar 16 – 31st
- EU0034: No reports Jan 1 – Mar 31st
- EU0045: No reports Jan 6 – Feb 19th, Mar 2 – 31st
- EU0052: No reports Jan 3 – Mar 31st

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- EU0060: No reports Jan 1 – Feb 17th
 - EU0073: No reports Jan 1 – Mar 31st
 - EU0078: No reports Jan 1 – Mar 31st
 - EU0080: No reports Mar 9 – 18th
 - EU0082: No reports Jan 1 – Mar 31st
 - EU0086: No reports Jan 1 – Mar 31st
 - EU0110: No reports Mar 1 – 11th
 - EU0120: No reports Jan 1 – 16th, Jan 18 – Mar 31st
 - EU0123: No reports Jan 1 – Feb 19th, Mar 17 – 31st
 - EU0140: No reports Jan 5 – 30th
 - EU0154: No reports Jan 1 – Mar 31st
 - EU0202: No reports Mar 13 – 31st
 - EU0203: No reports Jan 1 – Mar 31st
 - EU0209: No reports Jan 1 – Mar 31st
 - EU0233: No reports Feb 16 – 29th, Mar 3 – 14th, 18 – 31st
 - EU0263: No reports Feb 5 – Mar 31st
 - EU0281: No reports Jan 1 – Mar 31st
 - EU0301: No reports Jan 12 – 21st
 - EU0321: No reports Jan 1 – Mar 31st
 - EU0350: No reports Feb 20 – 29th
 - EU0359: No reports Feb 7 – 16th
 - EU0394: No reports Jan 1 – Feb 29th
 - EU0445: No reports Feb 1 – 18th
 - EU0451: No reports Mar 22 – 31st
 - EU0456: No reports Jan 1 – 13th
 - EU0458: No reports Jan 14 – 28th
 - EU0476: No reports Mar 4 – 31st
 - EU0490: No reports Jan 13 – 31st, Feb 10 – 22nd, Mar 1 – 31st
 - EU0498: No reports Jan 1 – Mar 31st
 - EU0568: No reports Jan 1 – Mar 31st
 - EU0700: No reports Jan 5 – 22nd, Feb 1 – 14th, Feb 20 – Mar 31st
 - EU0711: No reports Jan 1 – Mar 31st
 - EU0723: No reports Jan 1 – Mar 31st
 - EU0734: No reports Jan 1 – Mar 31st
 - EU0826: No reports Jan 1 – Mar 31st
 - EU0830: No reports Jan 4 – Feb 11th, Feb 14 – Mar 31st
 - EU0902: No reports Feb 18 – Mar 31st
 - EU0934: No reports Jan 1 – Mar 31st
 - EU0942: No reports Jan 1 – 31st
 - EU0947: No reports Jan 9 – 19th, Feb 8 – 29th, Mar 3 – 31st
 - EU0961: No reports Jan 1 – Mar 31st
 - EU0970: No reports Feb 18 – Mar 31st
 - EU0985: No reports Jan 1 – Mar 31st
 - EU0999: No reports Jan 1 – Mar 31st
 - EU1002: No reports Jan 1 – Feb 29th
 - EU1012: No reports Feb 1 – Mar 14th
 - EU1035: No reports Jan 1 – 12th, Feb 4 – 15th, Mar 15 – 26th
 - EU1115: No reports Feb 20 – Mar 31st
 - EU1222: No reports Jan 1 – Mar 31st
 - EU1230: No reports Feb 20 – Mar 31st
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- EU1232: No reports Feb 9 – 29th
 - EU1247: No reports Feb 1 – Mar 31st
 - EU1259: No reports Feb 16 – Mar 31st
 - EU1261: No reports Jan 1 – Feb 29th
 - EU1275: No reports Feb 1 – Mar 31st
 - EU1312: No reports Jan 1 – Feb 17th
 - EU1337: No reports Jan 1 – Mar 17th
 - EU1345: No reports Jan 20 – 30th, Feb 16 – Mar 31st
 - EU1367: No reports Feb 1 – 10th, Feb 16 – Mar 31st
 - EU1389: No reports Feb 1 – Mar 31st
 - EU1436: No reports Jan 15 – 31st, Feb 18 – Mar 31st
 - EU1446: No reports Jan 1 – Mar 31st
 - EU1456: No reports Jan 1 – Mar 31st
 - EU1495: No reports Jan 1 – Mar 31st
 - EU1532: No reports Jan 1 – Feb 25th, Mar 1 – 31st
 - EU1538: No reports Jan 4 – 13th
 - EU1541: No reports Feb 1 – Mar 31st
 - EU1593: No reports Jan 1 – Feb 18th
 - EU1673: No reports Jan 6 – 30th
 - EU1700: No reports Jan 5 – 15th, Feb 3 – 17th
 - EU1731: No reports Feb 5 – 14th
 - EU1795: No reports Feb 1 – Mar 31st
 - EU1863: No reports Jan 1 – Mar 31st
 - EU1929: No reports Mar 1 – 11th
 - EU1976: No reports Feb 1 – 22nd, Mar 1 – 31st
 - EU2017: No reports Mar 8 – 31st
 - EU2043: No reports Mar 10 – 25th
 - EU2055: No reports Feb 5 – 29th
 - EU2120: No reports Mar 21 – 31st
 - EU2123: No reports Feb 7 – Mar 31st
 - EU2130: No reports Jan 1 – Mar 31st
 - EU2200: No reports Jan 21 – 31st
 - EU2276: No reports Feb 18 – 29th
 - EU2327: No reports Jan 1 – Mar 31st
 - EU2356: No reports Jan 3 – 15th, 21 – 30th, Mar 20 – 31st
 - EU2378: No reports Feb 1 – 10th
 - EU2397: No reports Jan 1 – Mar 31st
 - EU2401: No reports Jan 1 – Mar 31st
 - EU2407: No reports Feb 20 – Mar 31st
 - EU2429: No reports Feb 17 – Mar 31st
 - EU2430: No reports Jan 1 – Mar 31st
 - EU2454: No reports Feb 10 – Mar 31st
 - EU2484: No reports Jan 1 – Mar 31st
 - EU2495: No reports Jan 7 – 28th
 - EU2512: No reports Jan 1 – 12th, Feb 1 – 23rd
 - EU2530: No reports Jan 1 – Mar 31st
 - EU2547: No reports Jan 1 – Mar 31st
 - EU2590: No reports Jan 1 – Mar 31st
 - EU2595: No reports Mar 1 – 29th
 - EU2610: No reports Mar 1 – 20th
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- EU2618: No reports Jan 1 – Mar 31st
 - EU2630: No reports Mar 21 – 31st
 - EU2673: No reports Feb 3 – 12th, Feb 14 – Mar 31st
 - EU2896: No reports Feb 1 – Mar 31st
 - EU2905: No reports Feb 16 – Mar 31st
 - EU2978: No reports Jan 1 – Mar 31st
 - EU2984: No reports Jan 14 – 31st
 - EU3094: No reports Jan 20 – 31st
 - EU3125: No reports Feb 20 – Mar 31st
 - EU3169: No reports Feb 10 – 27th, Mar 6 – 16th
 - EU3181: No reports Jan 1 – 31st, Feb 4 – 13th
 - EU3268: No reports Feb 11 – 20th
 - EU3311: No reports Jan 1 – Feb 13th
 - EU3317: No reports Jan 1 – 12th
 - EU3527: No reports Feb 16 – 29th
 - EU3533: No reports Jan 1 – Mar 31st
 - EU3544: No reports Jan 1 – Mar 27th
 - EU3647: No reports Jan 12 – 31st
 - EU3660: No reports Jan 8 – 20th
 - EU3684: No reports Jan 1 – Mar 31st
 - EU3725: No reports Feb 18 – Mar 21st
 - EU3733: No reports Mar 8 – 20th
 - EU3747: No reports Mar 1 – 31st
 - EU3755: No reports Jan 1 – Feb 13th
 - EU3815: No reports Feb 13 – Mar 31st
 - EU3845: No reports Jan 1 – Mar 31st, 29th
 - EU3855: No reports Jan 1 – Mar 31st
 - EU3859: No reports Feb 18 – Mar 31st
 - EU3953: No reports Jan 1 – 17th
 - EU3961: No reports Jan 17 – Mar 24th
 - EU3972: No reports Jan 3 – 14th
 - EU3992: No reports Mar 4 – 31st
 - EU4004: No reports Jan 1 – 19th, Mar 14 – 31st
 - EU4035: No reports Jan 6 – 15th, Feb 12 – Mar 31st
 - EU4066: No reports Feb 1 – 21st, Mar 22 – 31st
 - EU4112: No reports Jan 16 – 25th
 - EU4169: No reports Jan 18 – Feb 29th
 - EU4172: No reports Mar 1 – 20th
 - EU4333: No reports Jan 1 – Mar 31st
 - EU4463: No reports Mar 1 – 31st
 - EU4491: No reports Jan 17 – 31st
 - EU4508: No reports Mar 2 – 13th
 - EU4527: No reports Jan 1 – Mar 31st
 - EU4532: No reports Feb 17 – Mar 31st
 - EU4540: No reports Feb 14 – 29th
 - EU4589: No reports Jan 1 – Mar 31st
 - EU4611: No reports Jan 1 – Mar 31st
 - EU4685: No reports Jan 21 – 31st
 - EU4699: No reports Jan 1 – Mar 31st
 - EU4710: No reports Mar 1 – 10th
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- EU4721: No reports Feb 1 – 11th
 - EU4723: No reports Mar 7 – 26th
 - EU4756: No reports Jan 1 – Mar 31st
 - EU4773: No reports Jan 13 – Mar 31st
 - EU4792: No reports Jan 1 – 14th
 - EU4865: No reports Feb 1 – Mar 31st
 - EU4896: No reports Jan 1 – Mar 31st
 - EU4956: No reports Jan 1 – Mar 31st
 - EU4976: No reports Feb 9 – 18th
 - EU5134: No reports Jan 22 – Mar 31st
 - EU5141: No reports Jan 1 – Mar 31st
 - EU5175: No reports Jan 1 – Mar 31st
 - EU5191: No reports Jan 1 – Mar 31st
 - EU5245: No reports Jan 1 – Mar 31st
 - EU5360: No reports Jan 1 – Mar 31st
 - EU5372: No reports Jan 1 – Mar 31st
 - EU5387: No reports Jan 1 – Mar 31st
 - EU5463: No reports Jan 10 – 19th, Jan 22 – Feb 16th
 - EU5486: No reports Jan 7 – 25th
 - EU5511: No reports Jan 5 – 20th
 - EU5593: No reports Jan 12 – 21st, Mar 4 – 31st
 - EU5719: No reports Feb 10 – 29th, Mar 14 – 27th
 - EU5820: No reports Jan 9 – 27th, Feb 18 – 29th, Mar 11 – 22nd
 - EU6053: No reports Mar 1 – 16th
 - EU6094: No reports Mar 17 – 28th
 - EU6127: No reports Feb 20 – 29th
 - EU6148: No reports Jan 1 – 27th, Mar 14 – 26th
 - EU6188: No reports Feb 1 – 18th
 - EU6200: No reports Mar 1 – 21st
 - EU6281: No reports Jan 1 – Mar 31st
 - EU6321: No reports Jan 1 – Mar 31st
 - EU6527: No reports Jan 13 – 22nd
 - EU6821: No reports Jan 1 – Mar 31st
 - EU6870: No reports Mar 1 – 21st
 - EU6893: No reports Jan 1 – Mar 31st
 - EU6900: No reports Mar 1 – 30th
 - EU7001: No reports Jan 7 – 31st
 - EU7119: No reports Feb 1 – 13th
 - EU7285: No reports Feb 6 – 16th
 - EU7548: No reports Jan 1 – Mar 31st
 - EU7634: No reports Jan 1 – 14th
 - EU7635: No reports Jan 1 – Mar 13th
 - EU7724: No reports Feb 1 – 11th
 - EU8264: No reports Mar 4 – 22nd
 - EU8598: No reports Jan 1 – Feb 29th
 - EU8736: No reports Feb 1 – Mar 31st
 - EU8789: No reports Feb 14 – Mar 19th
 - EU8969: No reports Jan 21 – 31st
 - EU9234: No reports Jan 5 – Mar 31st
 - EU9245: No reports Feb 1 – Mar 31st
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- EU9378: No reports Jan 1 – 10th
 - EU9544: No reports Feb 7 – 29th
 - EU9589: No reports Jan 1 – Feb 29th
 - EU9680: No reports Feb 1 – 10th
 - EU9734: No reports Feb 1 – 13th
 - EU9967: No reports Jan 1 – 17th
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Specific problems:

- Several aircraft reporting wrong date Mar 1st – due to software error with onboard clock due to Leap Year – resolved by Feb 2nd.
 - EU5591: clock error Mar 11 – 16th
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Ground stations issues and other problems:

- Jan 4th: SAS software change affecting data totals from A330 and A340 (long haul aircraft). Problem resolved Jan 10th
 - Jan 8th and 19th: Italian ATC industrial action affected BA and LH totals.
 - Jan 23rd: Data not being processed by EADAS 08:30 – 11:05. This was due to an internet problem within the Met office – unable to ftp data from ARINC.
 - Several incidents during the period where LH data not being processed by EADAS – lasting 2-3 hours. System developer and E-AMDAR Programme investigating.
 - Feb 17th: French ATC industrial action affected AF data totals.
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Activated and deactivated aircraft:

- SAS B767 aircraft: informed by operator that all aircraft now deactivated Mar 2nd.
 - Jan 3rd: EU6021 and EU6127 activated by operator
 - Jan 5th: EU2400, EU2450, EU2484, EU2532, EU2627, EU2794 and EU2883 activated by operator.
 - Jan 23rd: EU6148 activated by operator.
 - Feb 16th: EU6118 activated by operator.
 - During the early stages of this period, various aircraft were being deactivated in support of EUCOS data experiments.
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(problems/faults reported here do not include maintenance periods and identified fleet rotation periods of less than 10 days. Information provided by the appointed Technical Co-ordinator of the E-AMDAR Programme; more details to be inserted in the following Quarterly reports)

Tables 4 to 6, Evaluation results

Presented values: Observation *minus* Reference (Model values), O–B.

All statistics are evaluated separately for two datasets:

- 1) Data from Ascent/Descent ($i_p i_p i_p = \text{ASC}$ or DES)
- 2) Cruise level, level flight at cruising height ($i_p i_p i_p = \text{LVR}$ or LVW)

Notes:

- Data with $i_p i_p i_p = \text{UNS}$ is **not** evaluated.
- AMDAR aircraft produce much more reports during Ascent/Descent than during Cruise level.
- O–B values larger than the stated criterion are presented in **bold**.
- Temperatures are in °C, wind speed in m/s and wind direction in degrees.
- The total number of reported observations in the table 4 to 6 differs from the total number in table 2. The main reason is that within table two data are presented from observations world wide, whereas in the tables 4 to 6 data are presented which were evaluated with using the HIRLAM model as reference. Since this model is a limited area model, only those data were evaluated which were observed within the HIRLAM area (roughly Europe, Northern Africa and the North Atlantic, see [Annex I](#) - Figure 7.) and within the three hours time-window around main and intermediate hours (eight times a day). Other reasons for this difference are incorrect encoding, cases with identical reports (only one is used) or in case of incomplete bulletins.
- Notice that a number of aircraft only report in ascent/descent phase.
- For wind direction (see c) table 6) the column "Observed" is not filled to avoid confusion. For the column with the mean differences (*i.e.* Obs-backgrnd, Mean), these values are calculated based on $\langle |\Delta DD| \rangle$ (=AVG(ABS(DD_OBS – DD_MOD))) resulting in non-negative values.

Legends

Number of Reports	Actual number of reports used for calculation of values
Observed Mean	Average value of the parameter for relevant phase in units of °C (for temperature), m/s (wind speed) or degrees (wind direction)
Observed SD	Standard Deviation of observed parameter
Obs–Backgrnd Mean	Average value of calculated differences (observed parameter minus model output value)
Obs–Backgrnd SD	Standard Deviation of calculated differences (observed parameter minus model output value)

a) Table 4, *Temperature (°C)*

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
	EU0002						5348	-18.4	17.6	-0.1	1.0
	EU0006	1146	-48.1	13.5	-0.1	1.7	1215	-1.3	19.9	0.0	1.1
	EU0021	1223	-48.8	14.9	-0.2	1.3	9255	-4.8	10.7	0.1	1.3
	EU0022	1810	-52.3	13.9	0.0	1.4	9373	-3.1	11.3	0.0	1.4
	EU0023	1533	-50.4	11.3	0.0	1.7	1448	-1.8	20.8	0.1	1.2
	EU0032	2487	-44.8	9.6	-0.1	1.3	2451	6.0	10.3	0.3	1.3
	EU0041	2007	-52.0	12.1	1.1	1.3	6661	-15.8	20.8	0.9	1.2
	EU0042	255	-54.8	5.1	-0.2	2.2					
	EU0043	1963	-52.6	12.3	0.8	1.4	5566	-17.7	21.2	0.5	1.3
	EU0045	413	-47.6	10.4	-0.6	1.5	343	3.3	15.1	0.1	1.4
	EU0046	1082	-50.9	12.8	0.5	1.4	1258	0.4	20.5	0.3	2.9
	EU0047	2094	-51.7	12.7	1.2	1.4	7306	-15.7	20.9	1.0	1.3
	EU0049						4627	-20.5	19.5	-0.2	1.3
	EU0051	2664	-51.7	13.3	-0.1	1.9	10998	-3.1	11.0	0.1	1.4
	EU0054	1449	-52.1	13.1	-0.3	1.6	6626	-4.4	11.2	0.1	1.3
	EU0055						4721	-18.2	18.0	0.0	1.1
	EU0059	1062	-48.4	16.6	0.1	1.2	5841	-16.6	19.7	0.2	1.1
	EU0060	4279	-49.4	9.4	-0.2	1.5	1705	6.3	14.6	0.1	1.2
	EU0061	1047	-47.3	17.3	-0.2	1.2	5222	-16.0	19.3	-0.1	1.3
	EU0072	2613	-51.5	12.8	0.4	1.4	11282	-2.3	11.2	0.5	1.5
	EU0080	1023	-53.5	10.7	0.0	1.4	657	-18.0	20.3	0.3	1.1
	EU0081	2686	-54.6	10.8	0.3	1.5	7458	-3.2	11.5	0.5	1.4
	EU0106	1287	-49.5	15.6	-0.2	1.4	6367	-16.8	19.8	-0.1	1.2
	EU0109	2068	-51.7	13.3	0.2	1.7	9046	-3.1	11.3	0.3	1.4
	EU0110	5745	-53.4	8.4	-0.1	1.5	2048	-12.9	25.5	0.0	1.4
	EU0123	182	-51.1	9.3	0.0	1.2	187	1.2	15.1	0.1	1.0
	EU0124						5015	-18.7	18.2	0.1	1.1
	EU0140	1072	-48.4	10.5	0.2	1.5	1479	3.1	19.6	0.1	1.3
	EU0158	1051	-48.3	15.5	0.6	1.2	5072	-14.6	19.1	0.7	1.2
	EU0167	1424	-48.8	14.0	0.6	1.2	5440	-15.3	19.1	0.8	1.3
	EU0185	1300	-48.5	15.4	0.5	1.1	5141	-15.2	19.2	0.7	1.2
	EU0202	5839	-54.4	8.3	-0.1	1.5	1609	-2.1	12.4	-0.1	1.1
	EU0204	3241	-54.1	11.0	0.6	1.3	9703	-2.8	11.6	0.8	1.4
	EU0206	1466	-51.5	9.3	0.2	1.5	1484	-0.4	21.1	0.2	1.9
	EU0230	2206	-56.1	9.3	0.1	1.4	713	-4.2	13.2	0.2	1.1
	EU0233	1433	-50.1	9.7	-0.2	1.6	1250	0.8	19.5	0.1	2.2
	EU0234						5186	-18.5	17.8	-0.2	1.1
	EU0251	1167	-49.8	15.3	-0.3	1.3	6314	-17.0	19.5	-0.3	1.2
	EU0263	1603	-53.0	7.9	0.1	1.8	1106	-1.7	11.3	0.4	1.3
	EU0290	2009	-49.6	9.1	0.2	1.7	1223	-0.3	19.8	0.1	1.2

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU0299						3781	-17.1	19.1	-0.2	1.1	
EU0301	1473	-50.8	12.4	0.8	1.4	5387	-15.8	20.8	0.6	1.2	
EU0303	1026	-47.9	15.2	-0.3	1.2	5381	-16.8	19.3	-0.2	1.2	
EU0307	1032	-47.1	17.0	0.0	1.2	5541	-16.4	19.6	0.0	1.2	
EU0310	7194	-54.8	8.5	-0.1	1.4	1981	-1.8	13.4	0.0	1.2	
EU0311	1192	-47.8	14.6	0.5	1.2	4376	-14.9	19.5	0.6	1.3	
EU0313	1517	-49.3	13.3	0.8	1.2	5152	-15.4	19.0	0.9	1.2	
EU0316	2024	-51.5	12.8	1.3	1.3	6213	-15.0	20.5	1.0	1.2	
EU0319	2030	-52.2	13.1	0.5	1.3	6327	-16.2	20.8	0.4	1.2	
EU0324	3974	-55.4	9.9	-0.5	1.3	8883	-3.8	11.6	-0.1	1.4	
EU0335	1953	-51.4	8.8	0.0	1.7	1101	-2.1	20.8	0.1	2.6	
EU0350	1170	-48.1	10.3	-0.1	1.5	546	-4.5	19.0	0.1	1.3	
EU0359	987	-46.8	15.9	1.4	1.3	4008	-14.3	19.3	1.2	1.2	
EU0367						5209	-18.5	17.5	-0.1	1.1	
EU0373	1059	-48.5	15.7	-0.2	1.2	5458	-16.2	19.6	0.0	1.1	
EU0394	356	-47.4	16.6	0.2	1.0	1877	-16.3	19.2	0.0	1.1	
EU0413	1293	-50.9	14.2	-0.5	1.2	5752	-16.8	19.4	-0.3	1.2	
EU0432						5011	-20.1	19.4	-0.2	1.1	
EU0442	938	-48.5	15.5	0.3	1.3	4592	-16.5	18.9	0.2	1.2	
EU0445	41	-45.2	20.0	-0.3	1.7	579	0.4	6.6	0.7	1.5	
EU0451	1566	-50.5	9.7	0.1	1.4	1322	-1.0	21.2	0.0	1.5	
EU0453	7040	-55.3	8.1	-0.6	1.5	1955	-1.4	13.1	-0.2	1.1	
EU0456	476	-40.9	20.8	0.2	1.3	3641	-18.4	21.1	0.4	1.2	
EU0457	3427	-52.2	8.8	0.2	1.6	817	12.0	11.8	0.1	1.5	
EU0458	530	-39.1	23.6	0.0	1.3	3863	-17.8	21.1	0.3	1.3	
EU0476	309	-40.7	21.8	0.1	1.4	2662	-19.4	21.0	0.2	1.4	
EU0490	521	-45.6	7.9	4.5	2.0	81	14.3	14.8	1.2	2.3	
EU0511	1338	-50.7	15.1	-0.3	1.2	5992	-15.2	19.6	-0.1	1.2	
EU0520	1863	-49.7	10.2	0.1	1.5	1194	-2.8	19.8	0.1	1.6	
EU0558	1101	-48.1	16.9	-0.4	1.2	5191	-16.5	19.5	-0.4	1.1	
EU0575	7272	-54.5	8.1	0.0	1.6	2112	-1.5	13.0	0.0	1.1	
EU0576	2748	-50.9	11.2	0.1	1.5	1640	-4.7	22.1	0.1	1.2	
EU0583	1247	-48.1	16.0	0.1	1.2	6063	-16.1	19.1	0.1	1.2	
EU0601	1198	-49.8	14.7	-0.1	1.2	5222	-15.8	19.1	0.0	1.2	
EU0620						4697	-14.5	16.9	0.0	1.1	
EU0631	2026	-49.8	9.8	0.0	1.6	1706	-4.7	19.8	0.1	1.3	
EU0676	952	-46.7	17.8	-0.5	1.3	5685	-16.0	19.1	-0.1	1.3	
EU0700	309	-53.9	7.1	0.5	1.7						
EU0707						3623	-16.9	17.2	-0.1	1.1	
EU0720	267	-48.4	9.7	0.2	1.1	1015	-3.0	11.5	0.1	1.2	
EU0802	1157	-48.9	15.8	0.3	1.1	4525	-13.9	18.7	0.5	1.3	

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU0807	3090	-49.7	11.4	0.2	1.3	13204	-2.9	11.3	0.3	1.4	
EU0810	909	-46.4	17.0	0.0	1.2	5627	-16.1	19.4	0.0	1.2	
EU0830	48	-52.9	6.2	0.4	2.1						
EU0875	1207	-48.4	14.8	0.9	1.1	4597	-13.3	18.9	0.8	1.3	
EU0902	114	-54.4	6.2	0.0	2.1						
EU0921	1196	-48.6	16.6	0.3	1.3	5537	-15.7	18.7	0.0	1.3	
EU0942	1212	-50.0	9.7	0.1	1.6	925	4.9	19.1	0.2	3.6	
EU0947	858	-50.3	10.3	0.4	2.0	682	4.5	13.7	0.4	1.2	
EU0970	605	-51.2	6.9	0.8	2.1						
EU1001						5443	-22.2	19.3	-0.4	1.1	
EU1012	1219	-51.9	9.9	-0.2	1.6	609	-0.7	20.5	0.0	0.8	
EU1035	1587	-52.0	9.4	0.0	1.6	956	-6.2	21.2	0.3	2.5	
EU1054	2115	-49.0	14.8	0.3	1.7	1027	-5.1	19.4	0.1	1.3	
EU1056						3373	-19.9	17.5	0.1	1.1	
EU1115	1341	-52.9	6.6	0.2	2.0						
EU1230	215	-51.9	5.6	0.7	2.5						
EU1232	1312	-50.3	9.1	0.2	1.7	829	0.9	19.2	0.0	1.2	
EU1234	1402	-49.7	15.6	-0.4	1.3	5921	-15.9	19.1	-0.1	1.2	
EU1259	873	-51.4	6.7	1.6	2.1						
EU1282	5539	-50.9	9.1	-0.1	1.5	913	7.3	12.7	0.0	0.6	
EU1301	8630	-52.6	8.6	-0.1	1.6	4476	2.2	13.4	0.2	1.3	
EU1312	4377	-53.4	7.5	-0.1	1.6	2146	3.0	14.7	0.3	1.1	
EU1320	2017	-49.9	9.2	0.8	1.6	1167	-5.6	20.5	0.3	1.6	
EU1334	4616	-49.8	9.3	0.5	1.6	665	3.2	15.6	0.0	1.3	
EU1337	140	-41.0	20.2	0.5	1.1	897	-16.9	20.6	0.1	1.2	
EU1345	506	-52.8	5.9	0.2	2.2						
EU1346	1806	-52.4	8.9	0.0	1.6	948	-8.8	22.6	0.3	1.4	
EU1367	61	-49.0	5.7	1.2	2.2						
EU1411	2801	-51.3	8.9	0.3	1.6	310	12.1	13.9	-0.1	1.2	
EU1436	456	-51.0	6.2	1.5	1.8						
EU1437	1786	-50.3	9.9	0.1	1.5	1105	-2.0	19.1	0.1	1.1	
EU1498	1190	-48.3	15.8	-0.3	1.2	6347	-17.0	19.2	0.0	1.2	
EU1532						41	-30.4	13.4	-0.2	9.8	
EU1538	1635	-50.4	9.6	0.2	1.7	1193	-3.3	21.5	0.2	1.5	
EU1547	1305	-49.6	13.9	-0.2	1.3	5623	-16.9	20.0	-0.1	1.2	
EU1567						4738	-17.8	18.8	-0.2	1.1	
EU1593	1407	-50.0	10.6	-0.5	1.6	1210	-1.2	12.9	-0.2	1.5	
EU1599	1699	-48.6	14.7	0.1	1.8	1676	1.2	20.7	0.1	2.3	
EU1635	1753	-51.0	9.4	0.1	1.7	1608	-1.3	19.7	0.1	1.2	
EU1666	1706	-50.8	9.3	0.5	1.7	1211	1.3	20.2	0.1	1.1	
EU1673	1420	-49.0	13.3	-0.6	1.2	7709	-3.7	11.2	0.0	1.3	

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU1688	2135	-50.3	12.4	-0.4	1.2	11075	-3.3	11.0	0.0	1.3	
EU1698						4717	-17.6	18.0	0.1	1.2	
EU1700	1208	-50.7	9.2	0.2	1.7	1103	-1.2	19.3	0.2	3.0	
EU1731	1041	-49.3	11.9	-0.2	1.2	1370	-0.3	19.8	0.0	1.1	
EU1790	1185	-48.4	9.7	0.0	1.2	11502	-15.1	15.8	-0.1	1.3	
EU1800	864	-41.1	19.8	0.0	1.9	6346	-17.2	19.2	-0.1	1.1	
EU1929	2685	-51.6	8.7	0.4	1.6	415	16.5	11.0			
EU1976	372	-50.8	6.6	2.4	2.1						
EU2017	909	-50.6	15.8	-0.2	1.3	3802	-17.3	19.7	-0.2	1.2	
EU2020	844	-42.0	18.9	0.6	1.1	6767	-15.9	19.2	0.7	1.2	
EU2043	4388	-51.6	8.9	0.1	1.6	1380	3.8	14.0	0.1	1.2	
EU2055	789	-49.3	14.2	-0.4	1.2	3168	-15.2	19.5	-0.2	1.1	
EU2120	794	-44.9	16.6	-0.2	1.1	5722	-18.4	19.8	0.0	1.1	
EU2123	92	-49.9	7.5	2.2	1.9						
EU2165	1224	-49.7	15.4	-0.1	1.3	6119	-17.1	19.9	0.0	1.2	
EU2189	1316	-48.5	14.1	0.8	1.2	5125	-14.2	19.3	0.7	1.3	
EU2200	6121	-52.9	8.0	0.0	1.6	1688	-0.5	13.2	0.1	1.2	
EU2201	1150	-49.2	16.0	-0.6	1.2	5125	-17.2	19.7	-0.3	1.1	
EU2235	988	-43.3	18.1	-0.1	1.1	7643	-16.6	19.4	0.0	1.3	
EU2247	1160	-49.6	15.8	0.0	1.2	5337	-16.7	19.9	0.0	1.1	
EU2276	986	-54.6	6.8	0.3	2.1						
EU2301	1534	-51.5	13.0	0.9	1.3	5661	-14.9	20.8	0.6	1.2	
EU2356	640	-48.2	8.9	0.2	1.6	513	-14.2	20.7	0.3	1.3	
EU2360	915	-43.4	17.3	0.1	1.2	6748	-16.5	19.5	0.1	1.2	
EU2378						2591	-16.1	16.7	0.3	1.2	
EU2390						4889	-13.0	16.4	0.0	1.2	
EU2400						3866	-17.5	17.4	0.0	1.1	
EU2405	793	-41.1	16.1	0.9	2.8	8484	-17.7	20.3	0.6	1.2	
EU2407	200	-51.0	5.6	0.3	2.2						
EU2429	523	-54.5	6.6	0.6	2.0						
EU2450						3363	-16.4	17.5	0.2	1.2	
EU2454	476	-52.3	6.7	0.5	1.9						
EU2473	66	-49.0	6.8	4.5	1.9						
EU2491	143	-51.9	5.0	0.5	2.5						
EU2495	529	-40.5	15.4	0.2	0.9	6227	-17.0	19.9	0.3	1.1	
EU2512	397	-40.5	16.6	0.3	0.9	5878	-16.9	18.7	0.4	1.1	
EU2532						3320	-14.5	17.6	0.0	1.2	
EU2535	25	-44.8	1.2	5.1	1.4						
EU2559	1594	-50.3	12.9	1.0	1.4	5978	-16.5	20.5	0.6	1.2	
EU2595	1134	-55.0	9.4	-0.2	1.5	2855	-8.0	25.4	0.0	2.3	
EU2610	1525	-57.9	7.9	-0.3	1.4	3198	-15.9	24.5	0.0	1.9	

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU2622	643	-41.1	16.5	0.1	1.0	6735	-18.5	19.9	0.2	1.2	
EU2627						2817	-17.1	18.2	0.0	1.1	
EU2630	758	-55.2	8.9	0.3	1.5	3713	-15.3	16.7	-0.1	1.4	
EU2673	725	-57.3	12.0	-0.3	2.0	1087	-12.8	22.7	0.3	2.5	
EU2690	806	-43.4	14.3	-0.2	1.1	8205	-18.7	20.2	0.0	1.1	
EU2717	594	-39.3	15.0	0.0	1.0	8057	-18.0	19.8	0.2	1.1	
EU2751	9691	-50.9	9.4	-0.1	1.6	3738	3.2	13.3	0.2	1.3	
EU2752	745	-41.0	14.4	0.0	1.0	9766	-18.6	20.6	0.1	1.1	
EU2773	3599	-49.7	9.6	-0.1	1.5	659	4.1	11.5	0.0	1.5	
EU2792	863	-45.0	12.5	-0.4	0.9	8965	-19.6	20.8	-0.2	1.2	
EU2794						2626	-20.4	19.0	-0.1	0.9	
EU2795	3390	-53.0	8.6	-0.1	1.8	649	14.3	13.0			
EU2800	706	-40.1	13.3	-0.2	1.0	9371	-18.0	19.8	-0.1	1.2	
EU2829	539	-38.4	17.3	-0.4	1.0	6114	-18.2	19.8	-0.1	1.1	
EU2845	841	-49.2	11.3	-0.1	1.3	2604	-5.6	12.2	0.0	1.3	
EU2846	739	-42.6	13.2	0.1	1.0	9124	-17.6	19.7	0.3	1.1	
EU2883						2635	-18.6	18.1	0.2	1.1	
EU2897	672	-42.0	14.9	-0.3	0.9	7205	-18.6	20.0	-0.1	1.1	
EU2905	468	-43.7	16.5	0.0	1.1	4202	-15.5	19.2	0.3	1.3	
EU2912	1324	-47.3	13.6	-0.2	1.2	9770	-3.7	11.0	0.1	1.2	
EU2936	917	-44.3	18.1	-0.1	1.1	6520	-17.7	19.5	0.0	1.1	
EU2979	1043	-44.8	16.4	-0.1	1.1	7519	-17.8	19.8	0.1	1.1	
EU2983	914	-42.5	18.3	0.4	1.1	6565	-16.7	19.1	0.2	1.2	
EU2984	1413	-55.7	7.4	0.1	1.5	2821	-11.9	18.2	-0.4	1.3	
EU3000	1235	-48.8	15.8	-0.5	1.1	5215	-16.5	19.5	-0.2	1.1	
EU3042	1098	-47.0	16.3	0.9	1.5	5360	-15.5	19.5	0.9	1.3	
EU3048	1043	-39.4	23.9	-0.1	1.2	5715	-16.1	20.4	0.1	1.2	
EU3075	3582	-53.2	8.9	-0.3	1.7	717	11.3	10.7	-0.1	1.5	
EU3094	5055	-51.4	9.6	0.1	1.6	1457	-0.5	12.4	0.3	1.2	
EU3096	997	-44.4	16.8	0.3	1.1	6809	-14.9	19.2	0.3	1.2	
EU3113	83	-55.6	7.6	-0.7	1.7						
EU3114	985	-44.2	17.7	0.4	1.1	7313	-15.3	18.5	0.3	1.2	
EU3115	971	-43.4	17.1	1.1	1.2	7451	-16.3	19.1	0.6	1.2	
EU3125	714	-55.3	5.9	-0.5	2.0						
EU3147	3282	-52.0	9.9	0.0	1.5	543	10.3	11.4	0.0	1.0	
EU3169	293	-53.5	6.3	0.0	2.3						
EU3181	127	-54.6	4.7	0.3	1.7						
EU3194	887	-44.7	16.8	0.0	1.1	6578	-17.2	19.4	0.1	1.2	
EU3201	1033	-45.2	16.1	0.4	1.1	7138	-16.2	19.5	0.3	1.2	
EU3250	885	-42.4	18.4	0.2	1.0	6950	-15.8	19.3	0.1	1.2	
EU3257	1219	-48.0	16.4	0.1	1.3	5929	-15.4	19.1	0.0	1.3	

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU3260	950	-43.9	17.0	0.3	1.1	5813	-15.9	20.3	0.4	1.2	
EU3265						2979	-16.2	16.9	-0.1	1.1	
EU3268	1663	-56.1	8.1	0.5	1.5	2564	-10.8	19.0	0.2	1.4	
EU3270						5452	-17.2	18.0	0.4	1.2	
EU3293	827	-41.6	17.2	0.2	1.0	6962	-15.3	19.3	0.1	1.1	
EU3311	586	-44.9	17.8	-0.1	1.2	3746	-15.6	19.5	0.1	1.1	
EU3317	705	-42.4	18.6	0.0	1.1	5583	-15.9	19.0	0.2	1.2	
EU3321	847	-53.6	11.1	0.3	1.3	4668	-15.1	16.6	-0.3	1.3	
EU3358						4838	-22.1	19.4	-0.1	1.2	
EU3362	973	-44.4	17.3	0.5	1.1	6692	-16.6	19.7	0.6	1.2	
EU3375	969	-43.7	18.2	0.0	1.1	6007	-16.4	19.9	0.0	1.2	
EU3400	993	-47.9	14.7	0.1	1.1	6030	-18.6	20.0	0.2	1.3	
EU3421	1985	-52.5	11.3	1.4	1.5	5863	-14.7	20.8	1.1	1.3	
EU3455	1208	-47.0	16.1	0.6	1.1	7149	-17.2	20.1	0.3	1.2	
EU3469						4954	-21.7	20.1	-0.3	1.2	
EU3472	1000	-47.7	15.7	-0.3	1.1	6287	-18.4	20.7	-0.1	1.2	
EU3484	1061	-46.2	17.8	0.0	1.1	7915	-16.6	20.1	0.1	1.2	
EU3527	972	-47.8	14.8	-0.1	1.1	6254	-17.2	20.4	0.0	1.2	
EU3544	52	-44.7	20.6	0.1	1.2	214	-8.5	17.8	0.1	2.7	
EU3598	421	-34.3	23.0	0.4	1.3	3677	-18.5	21.2	0.5	1.2	
EU3599	372	-25.1	24.1	0.9	1.4	4223	-19.5	20.5	0.7	1.2	
EU3621						4811	-22.2	19.6	-0.5	1.2	
EU3633	1757	-52.2	8.9	0.5	1.5	2426	-1.9	19.9	0.2	1.1	
EU3647	905	-47.3	14.8	0.1	1.1	5209	-17.2	20.6	0.3	1.2	
EU3654	434	-52.8	9.2	0.5	1.2	8112	-15.8	15.1	0.1	1.4	
EU3660	1829	-52.7	8.2	0.4	1.6	2170	-1.1	20.0	0.2	1.5	
EU3701	1459	-52.4	9.2	0.3	1.5	2327	0.1	21.4	0.3	1.4	
EU3703	2490	-54.8	6.9	0.1	2.1						
EU3714						5852	-19.5	18.0	0.0	1.1	
EU3725	3170	-51.7	9.7	-0.3	1.6	350	6.1	12.7			
EU3733	1257	-52.7	9.8	0.4	1.6	1948	-0.6	20.7	0.2	1.4	
EU3747	106	-50.8	6.5	1.1	1.9						
EU3755						2353	-22.7	19.7	-0.4	1.2	
EU3768	1837	-52.0	8.5	0.2	1.6	2508	0.0	19.7	0.2	1.4	
EU3769	618	-54.7	6.5	0.6	2.0						
EU3781	430	-51.7	6.1	1.2	2.5						
EU3815	853	-54.6	6.4	0.0	2.0						
EU3824	2045	-52.5	9.0	0.7	1.5	3363	1.7	20.3	0.3	1.5	
EU3837	307	-54.5	4.5	0.6	2.1						
EU3859	430	-53.2	5.9	1.3	2.0						
EU3874	3034	-52.0	8.8	0.2	1.7	630	14.4	11.8			

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU3908	745	-52.1	9.0	0.4	1.5	12478	-15.3	16.1	-0.1	1.2	
EU3953	1761	-52.5	9.9	0.3	1.6	3553	6.3	17.5	0.2	2.0	
EU3961	460	-52.8	8.5	0.6	1.6	1053	0.8	17.3	0.2	1.0	
EU3972						3228	-22.2	19.7	-0.1	1.1	
EU3992	1277	-53.3	9.2	0.7	1.6	1597	-1.2	19.8	0.3	1.1	
EU4002	821	-55.1	8.4	0.2	1.5	4486	-15.0	16.7	0.0	1.3	
EU4004	935	-35.0	30.9	0.6	1.8	1099	-2.1	18.4	0.3	1.1	
EU4021						4464	-22.7	18.8	-0.3	1.1	
EU4035	592	-54.3	7.2	0.2	2.0	483	-10.9	18.5	0.7	1.3	
EU4066	1035	-53.2	9.2	0.0	1.7	1715	-0.1	20.5	0.1	1.2	
EU4075	1349	-47.8	8.2	0.1	1.1	10829	-15.8	16.1	0.0	1.3	
EU4083	1840	-51.2	9.4	0.6	1.6	3367	2.0	19.9	0.3	1.4	
EU4112	1620	-52.2	7.7	1.3	1.6	1488	-4.7	18.7	0.9	1.2	
EU4137	1122	-52.7	7.9	0.2	1.7	928	-7.3	17.9	0.4	1.3	
EU4169	1033	-49.6	10.1	0.5	1.5	1587	2.5	20.5	0.1	1.1	
EU4172	1024	-50.4	9.0	0.3	1.6	971	-4.5	17.8	0.4	1.3	
EU4205	1854	-55.4	7.1	0.1	1.6	1204	-2.9	17.2	0.4	1.1	
EU4235	1279	-52.4	8.3	0.4	1.4	1236	-1.6	19.2	0.6	1.4	
EU4264	1849	-52.6	9.5	0.2	1.7	3530	-0.8	20.4	0.1	1.4	
EU4278						4906	-21.3	20.2	-0.4	1.2	
EU4300	1588	-52.5	8.1	0.2	1.5	1577	-2.7	20.1	0.3	1.5	
EU4316	2106	-52.9	8.4	0.5	1.9	3655	-3.4	20.4	0.2	1.4	
EU4321	2564	-52.9	9.0	0.5	1.7	3904	-1.7	19.5	0.3	1.2	
EU4387						3031	-16.2	17.6	-0.2	1.2	
EU4392	1773	-51.7	10.0	0.2	1.5	4086	-0.7	21.0	0.1	1.5	
EU4426	1374	-47.7	14.2	-0.3	1.2	9329	-3.5	11.1	0.0	1.2	
EU4444	601	-51.1	9.6	0.0	1.2	10144	-15.9	15.4	0.0	1.3	
EU4450	1962	-53.1	8.8	0.3	1.5	3568	1.1	20.7	0.1	1.6	
EU4463						2282	-18.7	20.6	0.1	1.2	
EU4473	1643	-52.2	10.2	0.4	1.5	3023	2.3	20.4	0.1	1.5	
EU4491						3120	-21.0	19.8	-0.3	1.1	
EU4508	1828	-51.8	9.4	0.4	1.6	3434	0.4	20.9	0.3	1.2	
EU4519	394	-54.5	5.9	0.7	1.3	8365	-16.5	15.5	0.1	1.3	
EU4532	263	-29.4	25.1	1.0	2.7	2339	-18.2	19.6	0.5	1.3	
EU4540	899	-47.6	16.5	0.1	1.2	5152	-16.8	20.5	0.2	1.2	
EU4565						3781	-17.2	17.4	0.2	1.2	
EU4573	758	-53.7	8.6	0.4	1.4	12973	-14.5	16.0	0.0	1.2	
EU4579	1358	-48.8	14.4	0.1	1.1	7598	-18.4	20.4	0.2	1.3	
EU4582	952	-48.7	12.1	0.8	1.2	15068	-14.1	16.0	0.6	1.3	
EU4589	178	-44.4	13.1	0.2	1.2	368	6.9	9.1	0.7	1.2	
EU4591	904	-56.1	6.0	0.7	1.4	8422	-17.1	15.8	0.0	1.4	

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU4593	1872	-50.4	13.2	1.5	1.3	5711	-15.5	21.0	1.0	1.3	
EU4607	790	-54.4	6.4	0.4	1.4	8372	-16.2	15.8	0.2	1.3	
EU4623	1313	-47.8	14.9	0.7	1.2	7328	-17.0	20.8	0.6	1.3	
EU4650	1006	-45.7	17.0	-0.3	1.2	6927	-17.5	19.8	-0.1	1.3	
EU4685	5215	-53.9	6.9	0.1	1.6	2241	-14.0	17.5	0.0	1.5	
EU4687	1374	-48.7	14.2	-0.2	1.3	7773	-17.3	20.2	-0.1	1.3	
EU4710	1125	-49.1	14.7	0.0	1.1	5644	-17.3	21.2	0.3	1.3	
EU4721	420	-53.0	8.7	0.9	1.6	4185	-13.5	16.4	0.2	1.2	
EU4723	994	-48.4	14.4	0.1	1.2	5771	-18.2	20.3	0.3	1.3	
EU4773	137	-46.5	15.0	0.2	1.1	899	-17.2	20.2	0.1	1.2	
EU4792	741	-51.7	8.9	0.6	1.5	3675	-16.0	16.6	-0.2	1.3	
EU4824	1080	-46.5	16.0	0.0	1.1	6277	-17.8	20.0	0.2	1.2	
EU4833	1334	-48.6	14.7	-0.2	1.1	6849	-16.5	20.3	0.0	1.3	
EU4838						4481	-16.8	18.3	-0.3	1.1	
EU4853	498	-53.4	8.7	0.0	1.2	9304	-16.0	15.4	-0.2	1.4	
EU4864	1248	-47.8	14.9	0.0	1.2	7137	-17.0	20.5	0.2	1.2	
EU4950	747	-55.0	9.5	1.0	1.5	4411	-14.4	16.1	0.2	1.3	
EU4954	1163	-47.5	15.7	-0.3	1.2	6599	-17.1	20.1	0.1	1.3	
EU4976	1204	-47.8	16.2	-0.4	1.1	6134	-17.5	20.2	-0.1	1.2	
EU5050	1047	-46.2	16.5	1.5	1.2	6569	-16.0	20.0	1.2	1.3	
EU5073	1303	-47.5	15.2	0.0	1.2	7830	-17.3	20.8	0.0	1.2	
EU5098						4405	-18.9	18.1	-0.3	1.1	
EU5129	6884	-53.1	6.9	0.5	1.6	2531	-8.9	8.8	0.1	1.3	
EU5134						142	-0.8	16.2	-0.5	1.4	
EU5182	94	-48.5	13.8	0.8	1.2	463	-6.0	10.9	0.5	1.5	
EU5185	1253	-46.3	16.9	0.6	1.1	7318	-16.6	20.2	0.6	1.2	
EU5261	1309	-47.7	14.6	0.1	1.3	7776	-16.7	20.2	0.0	1.2	
EU5264	1253	-49.3	15.5	0.3	1.2	6237	-16.3	19.9	0.5	1.2	
EU5318	1173	-47.3	16.5	0.3	1.2	5368	-15.8	19.1	0.5	1.3	
EU5331	1693	-50.6	13.5	1.1	1.2	5369	-16.5	21.1	0.9	1.3	
EU5349						4799	-17.9	18.1	-0.1	1.2	
EU5351	1386	-48.8	14.2	0.5	1.2	5128	-14.7	18.7	0.5	1.3	
EU5397	6057	-52.7	7.0	0.9	1.8	2392	-8.9	9.7	0.1	1.2	
EU5420	1864	-53.1	8.9	0.2	1.5	2611	-1.7	20.5	0.2	1.3	
EU5429						12428	1.3	11.2			
EU5435	1161	-47.0	15.1	1.0	1.1	4901	-13.2	18.7	0.8	1.2	
EU5441	841	-51.8	8.7	0.7	1.3	3850	-15.8	16.6	0.1	1.2	
EU5463	2630	-55.4	7.2	0.2	1.5	3451	-8.0	22.6	0.0	1.9	
EU5478	701	-55.2	7.3	-0.1	1.4	13774	-15.0	15.8	-0.3	1.2	
EU5486	1435	-55.5	7.8	-0.2	1.7	2149	-9.7	22.3	0.0	1.6	
EU5511	1783	-54.6	8.0	0.3	1.5	2996	-6.9	22.5	0.0	1.7	

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU5529	789	-53.4	8.5	-0.2	1.2	14957	-15.0	15.9	-0.3	1.2	
EU5544	3188	-53.2	9.2	0.1	1.7	6479	-4.1	21.2	-0.2	1.5	
EU5587	1252	-47.7	15.9	0.7	1.2	4784	-14.3	19.1	0.5	1.2	
EU5591	1342	-47.1	13.0	-0.1	1.3	9176	-4.1	11.3	0.2	1.3	
EU5593	910	-42.4	11.3	0.0	1.4	1605	8.0	10.8	0.5	1.4	
EU5601						3361	-16.1	17.1	0.1	1.1	
EU5612	649	-57.8	5.4	-0.4	1.2	7152	-16.7	16.1	-0.2	1.3	
EU5613	1407	-48.4	14.8	0.6	1.2	4991	-14.5	19.1	0.3	1.2	
EU5635	2795	-53.5	8.8	0.2	1.6	5643	-2.2	21.2	0.0	1.6	
EU5643	965	-45.8	7.6	-0.4	0.9	6852	-14.6	16.0	-0.3	1.2	
EU5719	959	-52.7	7.9	0.0	1.9	733	1.0	18.0	0.1	1.4	
EU5820	554	-53.5	8.1	0.7	1.6	723	1.0	19.1	0.4	1.2	
EU5891	1223	-47.6	15.1	0.9	1.3	4965	-14.4	18.7	0.8	1.3	
EU6000	329	-31.7	25.0	0.4	1.3	3482	-19.2	20.2	0.6	1.2	
EU6021	3492	-47.8	9.1	-0.1	1.4	3694	4.1	19.8	0.0	0.9	
EU6053	2257	-47.2	8.6	0.3	1.6	2434	4.2	19.7	0.0	1.0	
EU6094	2094	-46.8	9.0	0.1	1.6	2164	5.1	18.8			
EU6113	3462	-54.9	7.1	0.2	1.7	1483	-6.4	9.9	-0.1	1.2	
EU6127	2622	-47.2	8.5	0.1	1.5	2738	3.7	19.8	0.0	0.9	
EU6148	1382	-47.7	8.8	0.2	1.4	1576	4.0	19.3			
EU6188	1283	-47.0	7.6	0.2	1.6	1453	2.7	19.2	0.1	1.4	
EU6200	237	-46.0	7.6	0.1	1.5	236	7.6	18.3			
EU6264	454	-55.0	6.3	0.3	1.3	9522	-16.2	15.3	0.1	1.3	
EU6287						4430	-21.8	19.4	-0.3	1.2	
EU6349	622	-55.3	9.9	0.9	1.3	3230	-14.6	16.6	0.5	1.4	
EU6386	1553	-47.4	13.5	0.0	1.1	10550	-3.5	11.0	0.1	1.3	
EU6444	530	-52.2	8.3	0.1	1.3	6318	-14.2	16.3	0.0	1.2	
EU6524	3054	-49.6	12.3	0.3	1.2	14199	-2.9	11.3	0.5	1.3	
EU6527	867	-50.9	13.6	0.5	1.4	3947	-14.4	16.9	-0.1	1.3	
EU6544	1923	-50.5	12.9	1.4	1.4	6469	-15.8	21.1	1.1	1.3	
EU6556	1845	-51.9	13.0	0.4	1.4	5158	-16.3	20.3	0.7	1.3	
EU6564	2034	-52.4	12.6	0.1	1.4	6577	-16.3	20.7	0.4	1.4	
EU6723	2020	-48.0	12.3	0.1	1.2	10660	-3.3	11.2	0.2	1.3	
EU6735	1790	-51.2	13.5	0.8	1.4	5925	-15.9	20.6	0.6	1.3	
EU6743	1246	-48.3	15.3	0.6	1.1	4872	-14.3	18.8	0.7	1.2	
EU6870	516	-49.8	9.2	0.2	1.7	1467	2.2	22.1	0.0	1.7	
EU6890	648	-54.4	8.2	0.2	1.4	3308	-15.1	16.9	0.1	1.4	
EU6900	32	-53.8	10.3	0.9	2.7	101	-5.2	27.2			
EU6923						4646	-18.2	20.5	-0.3	1.3	
EU7001	890	-48.4	16.0	0.7	1.1	3637	-15.7	18.7	0.8	1.2	
EU7082						4283	-21.4	20.1	-0.1	1.3	

2004-I TA	Temperature Cruise level in °C					Temperature Ascent & Descent in °C					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU7119	443	-36.7	22.2	0.5	1.2	2935	-19.6	20.3	0.3	1.3	
EU7218	852	-55.3	9.4	0.1	1.5	3650	-15.8	17.2	-0.2	1.2	
EU7285						4213	-19.3	18.1	-0.1	1.1	
EU7293	1299	-48.2	14.2	1.1	1.2	4182	-12.9	18.3	1.0	1.2	
EU7314	1700	-50.0	13.4	0.7	1.2	5212	-13.5	19.1	0.7	1.2	
EU7382	1545	-49.3	14.0	0.8	1.2	5060	-13.9	18.9	0.8	1.3	
EU7412	1601	-49.2	13.6	1.0	1.2	5216	-12.2	18.9	1.0	1.2	
EU7427	1729	-50.0	12.8	1.1	1.1	5564	-13.2	19.2	0.9	1.2	
EU7521						4949	-19.6	19.5	-0.1	1.2	
EU7536	1222	-47.7	15.2	0.4	1.1	4486	-14.4	19.0	0.6	1.1	
EU7610	1206	-47.1	16.0	0.0	1.1	7846	-18.0	20.6	0.1	1.2	
EU7629	866	-54.0	7.8	1.2	1.5	3568	-15.3	17.0	0.4	1.3	
EU7634						4145	-23.2	19.2	-0.2	1.2	
EU7635	179	-35.8	27.9	0.6	2.4	518	-17.6	24.5	0.1	1.3	
EU7643	834	-57.0	8.6	-0.5	1.6	3704	-15.1	17.1	-0.4	1.4	
EU7654	444	-55.7	7.4	-0.1	1.6	2573	-15.3	16.5	0.0	1.3	
EU7724	1078	-54.7	9.5	0.4	1.4	4272	-14.5	17.4	-0.1	1.3	
EU7864	2230	-51.0	10.6	0.0	2.0	1428	-3.2	20.2	0.3	4.4	
EU7865						4325	-19.9	19.9	-0.2	1.2	
EU7866	1060	-48.9	12.6	-0.7	1.2	3515	-6.1	12.0	-0.1	1.2	
EU7888	478	-55.4	5.5	0.5	1.3	8898	-15.6	15.5	0.2	1.3	
EU7894	393	-36.7	22.8	0.1	1.3	4228	-19.8	20.8	0.3	1.4	
EU7910	1000	-37.0	24.8	0.2	1.4	6822	-15.2	19.0	0.0	1.4	
EU8264						2917	-20.4	19.5	0.0	1.2	
EU8431						4645	-19.2	18.1	0.0	1.1	
EU8478						3890	-19.9	19.4	0.0	1.2	
EU8520	348	-52.3	6.8	1.3	1.5	3479	-13.8	15.5	0.3	1.2	
EU8598						1257	-20.1	19.8	0.0	1.1	
EU8605						4343	-18.5	19.4	-0.3	1.2	
EU8632						5691	-18.0	19.2	-0.4	1.2	
EU8733	1854	-51.4	12.8	0.8	1.3	6025	-15.3	20.3	0.6	1.2	
EU8736						902	-24.0	21.7	0.9	2.2	
EU8742	1999	-52.3	11.3	1.1	1.3	5668	-15.1	20.8	0.9	1.3	
EU8787	1047	-46.3	16.7	0.9	1.3	5261	-15.8	19.4	0.8	1.2	
EU8789						2145	-18.4	19.8	-0.3	1.3	
EU8891						3859	-19.4	19.1	-0.2	1.2	
EU8943						5019	-20.2	18.3	-0.1	1.1	
EU8969	572	-52.4	8.9	0.1	1.3	3448	-15.7	16.4	-0.2	1.3	
EU9013	1602	-49.5	15.0	0.1	1.1	5611	-13.4	18.7	0.4	1.3	
EU9023						3514	-18.8	20.2	-0.2	1.2	
EU9145	541	-52.0	8.7	0.8	1.4	5005	-15.6	16.6	0.0	1.2	

AIRCRAFT	Temperature Cruise level in °C					Temperature Ascent & Descent in °C				
	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
		Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU9158	790	-52.1	10.2	0.0	1.3	12357	-15.3	15.7	-0.1	1.2
EU9234	28	-62.0	3.2	0.8	1.0	323	-21.0	15.2	-0.5	2.3
EU9245	134	-57.8	4.9	0.2	1.4	1457	-17.8	14.8	0.1	1.5
EU9356						5317	-20.9	18.6	-0.3	1.1
EU9378						3194	-19.7	19.1	-0.3	1.2
EU9544	766	-44.9	7.6	-0.1	1.3	4769	-16.8	16.2	-0.4	1.2
EU9622	815	-55.4	7.2	0.1	1.2	9042	-16.6	16.1	-0.1	1.4
EU9678						4507	-19.2	19.7	-0.2	1.3
EU9680	1184	-57.1	7.2	-0.3	1.4	2212	-13.4	18.3	-0.1	1.4
EU9692						4401	-19.5	20.4	0.0	1.2
EU9723	1043	-46.6	16.1	0.8	1.2	5137	-13.9	19.1	0.8	1.3
EU9729	1667	-57.8	7.3	-0.1	1.5	3113	-10.5	18.9	-0.3	1.3
EU9734						3018	-21.8	19.7	-0.4	1.2
EU9743	1708	-46.0	8.5	-0.1	1.2	13385	-15.2	16.1	-0.2	1.2
EU9883	1291	-47.6	15.3	0.7	1.1	4926	-14.5	19.3	0.8	1.2
EU9967						3094	-20.6	19.9	-0.2	1.2

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b) Table 5, *Wind Speed (m/s)*

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU0002						5348	17.0	11.3	0.2	2.5	
EU0006	1146	24.6	15.0	0.0	2.4	1215	10.8	9.3	0.0	2.2	
EU0021	1223	26.3	16.2	0.5	3.0	9255	13.0	8.6	0.3	2.4	
EU0022	1810	25.7	13.6	0.1	2.8	9373	12.3	8.3	0.5	2.4	
EU0023	1533	25.8	16.9	0.1	2.6	1448	11.4	10.0	0.2	2.3	
EU0032	2487	24.0	16.1	0.1	2.1	2451	8.9	5.5	0.3	2.1	
EU0041	2007	25.0	13.7	0.2	2.5	6661	13.8	11.3	0.0	2.4	
EU0042	255	29.3	15.2	0.2	2.7						
EU0043	1963	25.1	14.7	0.2	2.6	5566	15.1	11.9	0.1	2.7	
EU0045	413	25.7	16.5	-0.2	2.6	343	7.8	5.1	0.2	1.8	
EU0046	1082	27.8	17.2	0.1	2.9	1258	12.9	12.6	0.0	2.8	
EU0047	2094	25.2	13.8	0.1	2.6	7306	13.5	11.2	-0.1	2.6	
EU0049						4627	18.0	12.2	0.4	2.8	
EU0051	2664	25.2	14.6	0.2	3.0	10998	11.3	8.1	0.5	2.3	
EU0054	1449	24.1	13.7	0.2	3.0	6626	10.8	7.4	0.6	2.4	
EU0055						4721	17.0	12.0	0.4	2.7	
EU0059	1062	23.6	14.8	0.2	2.6	5841	14.3	11.3	0.0	2.7	
EU0060	4279	24.2	16.7	0.0	2.5	1705	7.8	6.0	0.2	2.4	
EU0061	1047	23.0	13.6	0.4	2.9	5222	14.3	11.0	0.0	2.5	
EU0072	2613	28.0	13.5	0.2	3.0	11282	12.0	8.3	0.7	2.4	
EU0080	1023	21.6	14.2	0.1	2.3	657	14.7	10.5	0.1	2.6	
EU0081	2686	22.8	13.3	0.0	2.6	7458	11.6	7.8	0.6	2.3	
EU0106	1287	23.9	12.9	0.2	3.2	6367	13.9	11.1	0.1	2.5	
EU0109	2068	25.0	14.2	0.1	2.8	9046	11.6	8.1	0.7	2.3	
EU0110	5745	24.6	15.5	0.1	2.3	2048	13.1	8.9	0.3	2.2	
EU0123	182	24.6	13.7	0.0	2.0	187	9.0	5.2	0.0	2.2	
EU0124						5015	18.0	12.6	0.4	2.7	
EU0140	1072	25.3	16.2	0.1	2.7	1479	11.9	11.2	0.0	2.8	
EU0158	1051	26.5	15.1	0.4	2.7	5072	15.5	11.9	-0.1	2.5	
EU0167	1424	25.9	14.3	0.4	2.8	5440	14.7	11.3	0.1	2.5	
EU0185	1300	25.1	14.4	0.2	2.6	5141	13.8	11.0	-0.1	2.3	
EU0202	5839	23.8	15.0	0.1	2.3	1609	9.9	7.4	0.1	1.9	
EU0204	3241	26.4	14.8	0.4	3.0	9703	11.7	8.3	0.7	2.4	
EU0206	1466	29.8	17.2	0.1	2.6	1484	12.1	12.3	0.1	2.1	
EU0230	2206	23.2	12.7	0.0	2.2	713	10.5	7.5	0.2	1.9	
EU0233	1433	29.5	19.0	0.2	2.8	1250	9.5	10.9	-0.1	2.4	
EU0234						5186	15.3	10.5	0.1	2.6	
EU0251	1167	25.3	14.6	0.3	2.8	6314	14.9	11.2	0.0	2.5	
EU0263	1603	34.2	15.8	0.2	2.8	1106	12.7	7.9	0.5	2.5	
EU0290	2009	28.5	17.4	0.2	2.7	1223	10.1	10.0	0.1	2.4	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU0299						3781	17.1	12.1	0.4	2.8	
EU0301	1473	24.1	14.2	0.1	2.7	5387	13.7	11.5	-0.2	2.6	
EU0303	1026	23.7	13.7	0.1	2.8	5381	14.7	11.5	0.0	2.6	
EU0307	1032	25.0	13.2	0.2	2.9	5541	15.3	12.0	0.0	2.6	
EU0310	7194	23.8	14.7	0.1	2.0	1981	10.4	7.6	0.1	2.0	
EU0311	1192	24.7	14.5	0.1	2.6	4376	13.5	10.7	0.0	2.4	
EU0313	1517	23.9	13.9	0.2	2.6	5152	13.8	11.0	-0.2	2.5	
EU0316	2024	25.3	13.3	0.2	2.8	6213	14.3	11.0	0.1	2.5	
EU0319	2030	25.2	14.0	0.1	2.6	6327	14.2	11.5	-0.2	2.4	
EU0324	3974	24.4	13.7	0.1	2.7	8883	11.7	7.9	0.7	2.4	
EU0335	1953	30.3	19.0	0.2	2.7	1101	11.6	11.1	0.1	2.8	
EU0350	1170	24.8	16.2	0.1	2.7	546	8.5	7.8	0.1	2.2	
EU0359	987	23.2	14.2	0.3	2.8	4008	12.9	10.4	0.0	2.4	
EU0367						5209	16.5	11.5	0.4	2.8	
EU0373	1059	23.3	13.3	0.2	2.7	5458	14.7	11.2	0.1	2.4	
EU0394	356	18.8	10.1	0.4	2.5	1877	11.8	9.5	-0.2	2.5	
EU0413	1293	23.8	13.4	0.3	2.9	5752	13.7	10.7	0.0	2.8	
EU0432						5011	15.8	11.2	0.2	2.6	
EU0442	938	23.2	13.9	0.4	2.8	4592	13.7	10.3	0.0	2.7	
EU0445	41	31.9	18.5	0.3	2.0	579	9.7	5.9	0.7	2.2	
EU0451	1566	28.6	17.5	0.2	2.7	1322	10.9	11.0	0.1	2.5	
EU0453	7040	25.2	15.5	0.1	2.1	1955	10.6	7.8	0.2	1.8	
EU0456	476	24.2	15.8	0.2	3.0	3641	16.7	11.7	0.5	2.6	
EU0457	3427	23.9	14.8	0.1	2.5	817	9.6	5.6	0.2	1.7	
EU0458	530	21.3	13.8	0.3	2.7	3863	15.4	11.6	0.4	2.5	
EU0476	309	24.6	13.8	0.4	3.3	2662	17.2	12.3	0.7	2.7	
EU0490	521	26.5	16.4	0.4	2.5	81	9.6	8.0	0.8	2.0	
EU0511	1338	25.5	14.2	0.3	2.7	5992	14.0	10.7	0.2	2.4	
EU0520	1863	26.8	17.0	0.1	2.2	1194	10.3	8.9	0.0	2.4	
EU0558	1101	25.1	14.1	0.5	2.9	5191	15.9	12.2	-0.2	2.7	
EU0575	7272	24.5	15.1	0.0	2.3	2112	11.4	8.2	0.2	1.9	
EU0576	2748	27.1	16.9	0.1	2.3	1640	13.2	11.6	0.1	2.3	
EU0583	1247	24.9	14.1	0.3	2.9	6063	13.6	10.9	0.0	2.5	
EU0601	1198	24.8	12.7	0.0	2.7	5222	14.2	10.7	-0.1	2.4	
EU0620						4697	13.6	9.8	0.2	2.4	
EU0631	2026	26.9	16.7	0.1	2.6	1706	11.0	9.9	0.1	2.4	
EU0676	952	24.0	14.6	0.4	2.7	5685	14.9	11.3	0.0	2.6	
EU0700	309	24.5	11.8	-0.1	2.3						
EU0707						3623	15.1	10.6	0.2	2.7	
EU0720	267	22.2	17.4	0.1	3.2	1015	8.5	5.9	0.4	2.2	
EU0802	1157	24.7	13.4	0.4	2.6	4525	13.1	10.1	0.2	2.4	
EU0807	3090	27.4	14.6	0.4	3.1	13204	11.7	8.1	0.5	2.5	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU0810	909	23.0	13.7	0.3	2.6	5627	15.7	12.5	0.0	2.7	
EU0830	48	33.6	15.4	0.7	4.7						
EU0875	1207	25.2	14.2	0.1	2.7	4597	14.0	9.5	0.2	2.2	
EU0902	114	36.1	15.6	0.1	2.7						
EU0921	1196	22.8	13.5	0.2	2.7	5537	13.8	10.5	0.1	2.6	
EU0942	1212	27.4	15.8	0.2	2.4	925	9.0	7.8	0.0	1.7	
EU0947	858	35.5	17.4	0.3	3.9	682	11.8	8.0	0.2	2.5	
EU0970	605	28.4	16.1	0.0	2.4						
EU1001						5443	17.1	11.8	0.1	2.7	
EU1012	1219	28.3	15.9	0.2	2.7	609	14.0	10.3	0.1	1.9	
EU1035	1587	27.1	15.9	0.1	2.6	956	11.5	11.5	0.0	2.5	
EU1054	2115	29.0	18.6	0.1	2.8	1027	11.1	10.3	0.0	3.0	
EU1056						3373	15.6	11.1	0.1	2.4	
EU1115	1341	26.0	14.4	0.2	2.6						
EU1230	215	35.5	16.7	-0.2	3.0						
EU1232	1312	29.8	19.2	0.0	2.7	829	9.3	8.5	0.1	2.3	
EU1234	1402	25.7	15.1	0.2	2.9	5921	14.2	11.7	-0.1	2.5	
EU1259	873	26.3	15.2	0.0	2.5						
EU1282	5539	24.3	16.3	0.1	2.3	913	7.6	6.5	0.0	3.0	
EU1301	8630	28.1	16.6	0.1	2.6	4476	10.2	7.9	0.2	2.2	
EU1312	4377	28.9	16.2	0.1	2.5	2146	10.4	7.0	0.4	2.1	
EU1320	2017	28.1	17.8	0.1	2.5	1167	14.0	12.2	0.1	2.1	
EU1334	4616	22.7	16.1	0.0	2.3	665	9.6	7.5	0.0	1.4	
EU1337	140	14.6	11.6	0.0	2.5	897	19.5	17.0	1.0	3.1	
EU1345	506	29.3	22.7	0.3	2.8						
EU1346	1806	29.6	17.6	0.2	2.8	948	16.9	14.6	0.1	3.0	
EU1367	61	37.7	19.1	-0.6	2.2						
EU1411	2801	25.6	15.8	0.2	2.4	310	6.5	6.2	0.1	1.5	
EU1436	456	29.6	21.2	0.2	2.4						
EU1437	1786	27.7	16.7	0.1	2.9	1105	11.8	10.5	0.1	2.9	
EU1498	1190	23.7	14.2	0.2	2.7	6347	14.9	11.8	-0.2	2.7	
EU1532						41	25.1	10.7	2.3	7.8	
EU1538	1635	29.1	18.7	0.1	2.7	1193	11.3	11.1	0.2	2.4	
EU1547	1305	25.4	14.4	0.3	3.0	5623	14.3	11.6	0.1	2.7	
EU1567						4738	16.6	11.4	0.3	2.5	
EU1593	1407	24.8	13.9	0.2	2.5	1210	11.5	7.8	0.4	2.7	
EU1599	1699	28.1	19.0	0.1	2.7	1676	11.2	11.0	0.1	2.0	
EU1635	1753	29.6	18.5	0.1	2.7	1608	11.6	11.0	0.0	2.6	
EU1666	1706	30.4	17.3	0.1	2.8	1211	12.3	11.1	0.2	3.0	
EU1673	1420	27.0	15.2	0.1	3.0	7709	11.5	8.2	0.3	2.3	
EU1688	2135	25.1	14.5	0.3	2.8	11075	11.2	8.1	0.4	2.3	
EU1698						4717	19.1	12.4	0.4	2.5	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU1700	1208	28.9	17.9	0.2	2.9	1103	8.5	8.1	0.2	2.3	
EU1731	1041	24.6	14.5	0.0	2.4	1370	11.1	11.6	0.1	2.8	
EU1790	1185	24.1	13.7	0.5	2.8	11502	12.0	9.1	0.3	2.4	
EU1800	864	23.3	14.6	0.2	2.6	6346	13.9	10.3	0.4	2.5	
EU1929	2685	26.6	16.4	0.0	2.6	415	8.7	6.8			
EU1976	372	26.3	18.4	0.1	2.5						
EU2017	909	25.3	12.7	0.1	2.6	3802	14.9	10.5	0.0	2.6	
EU2020	844	23.6	14.4	0.4	3.0	6767	14.7	10.9	0.4	2.6	
EU2043	4388	22.9	16.8	0.1	2.5	1380	8.8	7.0	0.3	1.9	
EU2055	789	25.5	15.4	0.3	2.9	3168	13.6	9.9	0.0	2.6	
EU2120	794	26.4	13.8	0.4	3.1	5722	16.1	11.7	0.2	2.7	
EU2123	92	19.9	8.5	0.5	2.2						
EU2165	1224	25.9	14.9	0.3	2.7	6119	14.6	11.1	0.0	2.5	
EU2189	1316	24.8	14.7	0.3	2.7	5125	14.6	12.0	-0.1	2.6	
EU2200	6121	24.2	15.4	0.1	2.3	1688	11.1	8.2	0.1	1.9	
EU2201	1150	25.8	14.1	0.5	2.9	5125	13.4	10.7	-0.1	2.6	
EU2235	988	24.5	14.7	0.4	3.0	7643	15.6	11.4	0.4	2.6	
EU2247	1160	24.8	14.7	0.3	2.8	5337	14.8	11.7	0.0	2.6	
EU2276	986	28.4	16.3	0.0	2.8						
EU2301	1534	25.3	13.9	0.2	2.7	5661	14.3	11.8	0.0	2.4	
EU2356	640	22.5	16.2	-0.1	2.6	513	18.0	14.0	0.5	2.5	
EU2360	915	24.8	15.2	0.5	2.9	6748	15.7	11.9	0.4	2.7	
EU2378						2591	15.8	10.9	0.3	2.7	
EU2390						4889	16.9	10.9	0.0	2.7	
EU2400						3866	15.6	11.3	0.3	2.4	
EU2405	793	24.3	14.0	0.4	2.8	8484	16.1	12.2	0.2	2.4	
EU2407	200	36.7	22.0	-0.2	3.0						
EU2429	523	29.3	16.0	0.1	2.7						
EU2450						3363	15.4	11.7	0.5	2.7	
EU2454	476	31.0	17.3	0.4	3.2						
EU2473	66	28.9	12.5	-0.7	2.9						
EU2491	143	30.3	21.9	0.3	2.2						
EU2495	529	23.3	13.9	0.4	2.7	6227	15.9	12.2	0.2	2.3	
EU2512	397	24.8	15.5	0.5	3.1	5878	17.4	12.9	0.6	2.8	
EU2532						3320	14.2	10.6	0.1	2.5	
EU2535	25	40.1	15.4	-0.1	1.7						
EU2559	1594	23.8	13.5	0.1	2.5	5978	14.8	12.3	0.1	2.6	
EU2595	1134	31.4	16.6	0.3	2.7	2855	14.5	13.1	0.3	3.3	
EU2610	1525	25.0	14.6	0.3	2.8	3198	14.8	12.2	0.4	3.2	
EU2622	643	24.6	14.7	0.5	3.2	6735	17.5	13.4	0.3	2.6	
EU2627						2817	15.9	11.9	0.4	2.6	
EU2630	758	23.4	13.0	0.1	2.5	3713	13.7	9.9	0.3	2.6	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU2673	725	23.1	13.6	0.1	2.5	1087	11.6	11.9	0.0	2.6	
EU2690	806	23.2	13.6	0.2	2.7	8205	15.0	11.7	0.3	2.4	
EU2717	594	26.0	14.6	0.3	3.2	8057	17.3	12.9	0.4	2.6	
EU2751	9691	25.7	16.8	0.1	2.5	3738	10.0	7.7	0.3	2.5	
EU2752	745	23.3	13.9	0.4	2.8	9766	15.1	11.9	0.3	2.4	
EU2773	3599	26.2	17.2	0.1	2.3	659	10.9	7.8	0.0	2.2	
EU2792	863	26.3	14.0	0.4	2.8	8965	16.5	12.3	0.2	2.7	
EU2794						2626	16.0	11.9	0.3	2.6	
EU2795	3390	24.4	15.0	0.1	2.9	649	8.4	5.8			
EU2800	706	25.5	13.8	0.2	2.8	9371	16.4	12.8	0.2	2.6	
EU2829	539	23.8	15.3	0.4	3.0	6114	15.6	11.7	0.4	2.5	
EU2845	841	28.9	15.7	0.3	2.9	2604	13.1	8.8	0.6	2.6	
EU2846	739	25.7	13.4	0.5	3.2	9124	14.4	11.5	0.2	2.4	
EU2883						2635	15.6	11.3	0.2	2.5	
EU2897	672	23.5	14.0	0.4	2.7	7205	14.9	11.2	0.3	2.4	
EU2905	468	27.8	15.6	0.4	2.9	4202	16.7	13.3	0.4	3.0	
EU2912	1324	25.4	15.3	0.3	3.1	9770	12.2	8.0	0.4	2.4	
EU2936	917	25.2	16.1	0.4	3.0	6520	15.7	12.9	0.5	2.7	
EU2979	1043	23.0	13.1	0.5	3.1	7519	15.0	11.5	0.3	2.5	
EU2983	914	23.7	14.1	0.3	2.7	6565	15.0	11.7	0.1	2.6	
EU2984	1413	23.2	13.4	0.1	2.4	2821	12.5	9.2	0.3	2.6	
EU3000	1235	25.9	15.1	0.3	2.6	5215	14.9	11.5	0.0	2.5	
EU3042	1098	24.1	13.8	0.3	3.2	5360	14.5	11.4	0.0	2.5	
EU3048	1043	22.0	14.6	0.3	2.6	5715	15.2	11.6	0.2	2.5	
EU3075	3582	24.5	15.2	0.1	2.4	717	8.2	5.9	0.2	1.6	
EU3094	5055	25.5	15.8	0.1	2.5	1457	9.5	6.8	0.4	2.2	
EU3096	997	24.9	14.4	0.3	2.9	6809	15.0	11.5	0.2	2.5	
EU3113	83	36.0	18.6	0.2	3.0						
EU3114	985	24.4	14.7	0.3	3.0	7313	15.0	11.5	0.2	2.6	
EU3115	971	24.7	14.8	0.2	3.0	7451	14.5	11.1	0.2	2.6	
EU3125	714	29.9	17.3	0.2	2.7						
EU3147	3282	23.6	15.8	0.2	2.4	543	7.3	5.2	0.1	2.8	
EU3169	293	39.9	14.4	0.5	3.2						
EU3181	127	28.5	14.2	0.0	2.5						
EU3194	887	22.7	13.6	0.2	2.6	6578	16.3	11.9	0.3	2.6	
EU3201	1033	25.9	14.0	0.4	2.8	7138	14.4	11.1	0.4	2.5	
EU3250	885	24.3	14.3	0.5	2.9	6950	15.3	12.0	0.2	2.7	
EU3257	1219	23.3	13.6	0.2	2.8	5929	14.2	11.1	0.0	2.7	
EU3260	950	24.7	14.7	0.6	2.9	5813	16.0	12.0	0.5	2.7	
EU3265						2979	14.2	9.7	0.1	2.5	
EU3268	1663	24.7	15.0	0.3	2.7	2564	11.8	8.7	0.3	2.3	
EU3270						5452	16.6	12.1	0.5	2.8	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU3293	827	21.2	13.3	0.4	2.8	6962	16.2	11.7	0.3	2.6	
EU3311	586	20.7	11.7	0.3	2.5	3746	13.5	9.7	0.3	2.4	
EU3317	705	23.3	14.7	0.3	2.7	5583	14.1	11.3	0.3	2.5	
EU3321	847	24.0	13.5	0.3	2.5	4668	13.1	10.0	0.3	2.5	
EU3358						4838	16.4	11.6	0.3	2.5	
EU3362	973	24.4	14.6	0.3	2.6	6692	15.7	11.7	0.3	2.6	
EU3375	969	23.8	14.3	0.3	3.1	6007	13.3	10.6	0.3	2.5	
EU3400	993	22.9	13.5	0.3	3.1	6030	14.9	11.3	0.2	2.9	
EU3421	1985	25.1	14.4	0.3	2.7	5863	14.8	11.6	0.1	2.7	
EU3455	1208	25.7	13.7	0.4	2.7	7149	14.0	11.3	0.1	2.6	
EU3469						4954	16.4	11.8	0.5	2.7	
EU3472	1000	26.2	15.3	0.3	3.0	6287	14.6	11.8	0.2	2.7	
EU3484	1061	25.5	14.4	0.3	2.9	7915	14.9	11.4	0.3	2.8	
EU3527	972	27.1	16.1	0.4	2.9	6254	16.4	13.4	0.3	2.7	
EU3544	52	16.3	10.6	0.5	2.5	214	6.5	4.8	1.0	2.8	
EU3598	421	19.0	12.8	0.5	2.8	3677	16.6	11.9	0.7	2.6	
EU3599	372	16.3	12.3	0.3	5.3	4223	16.5	12.0	0.8	2.7	
EU3621						4811	17.5	12.3	0.4	2.4	
EU3633	1757	28.7	17.9	0.2	2.4	2426	13.1	11.7	0.2	2.5	
EU3647	905	23.9	14.0	0.4	2.8	5209	15.5	13.0	0.2	2.3	
EU3654	434	22.2	14.1	0.3	2.4	8112	11.2	8.4	0.4	2.5	
EU3660	1829	30.9	16.7	0.2	2.9	2170	13.4	12.1	0.2	2.5	
EU3701	1459	31.5	15.2	0.3	2.9	2327	12.3	11.3	0.4	2.9	
EU3703	2490	26.5	15.5	0.1	2.6						
EU3714						5852	16.9	12.3	0.4	2.9	
EU3725	3170	21.6	15.2	0.0	2.2	350	8.9	6.9			
EU3733	1257	30.3	15.9	0.2	2.5	1948	13.8	13.0	0.2	2.6	
EU3747	106	35.2	11.9	0.4	2.5						
EU3755						2353	18.7	12.6	0.5	2.7	
EU3768	1837	30.2	17.0	0.3	2.6	2508	12.7	12.3	0.3	2.3	
EU3769	618	25.1	13.9	0.0	2.9						
EU3781	430	34.2	18.6	0.1	2.8						
EU3815	853	29.2	17.3	0.2	2.7						
EU3824	2045	30.9	17.3	0.2	2.8	3363	12.5	12.1	0.3	2.5	
EU3837	307	42.0	18.4	0.6	2.7						
EU3859	430	28.9	19.9	0.3	2.6						
EU3874	3034	27.6	15.2	0.1	2.3	630	8.6	6.5			
EU3908	745	21.9	13.5	0.2	2.9	12478	11.7	9.2	0.2	2.6	
EU3953	1761	30.8	15.8	0.3	2.9	3553	9.1	8.2	0.1	2.1	
EU3961	460	34.9	15.6	0.3	2.7	1053	10.7	9.1	0.3	2.0	
EU3972						3228	16.4	11.2	0.4	2.5	
EU3992	1277	31.3	15.9	0.2	2.6	1597	11.5	10.5	0.0	2.1	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU4002	821	20.4	12.0	-0.1	2.4	4486	11.8	8.6	0.2	2.4	
EU4004	935	23.1	18.8	0.1	2.7	1099	10.8	8.4	0.3	2.0	
EU4021						4464	17.9	11.9	0.5	2.6	
EU4035	592	29.6	17.6	0.2	2.9	483	20.4	13.7	0.7	2.7	
EU4066	1035	28.9	15.6	0.2	2.7	1715	12.0	10.8	0.1	2.7	
EU4075	1349	21.2	13.4	0.4	2.9	10829	11.6	9.1	0.3	2.5	
EU4083	1840	29.9	13.9	0.2	2.9	3367	11.9	10.5	0.4	2.6	
EU4112	1620	28.1	15.8	0.2	2.5	1488	12.8	10.7	0.2	2.3	
EU4137	1122	29.0	17.3	0.2	2.4	928	11.9	10.0	0.4	2.6	
EU4169	1033	30.8	16.8	0.1	2.7	1587	10.1	8.8	0.0	2.0	
EU4172	1024	28.0	17.1	0.2	2.7	971	14.5	10.7	0.4	2.6	
EU4205	1854	32.3	17.7	0.2	2.7	1204	12.9	10.2	0.3	2.7	
EU4235	1279	29.4	16.1	0.0	2.8	1236	12.1	10.1	0.3	2.4	
EU4264	1849	30.8	16.0	0.2	2.6	3530	11.5	10.3	0.3	2.3	
EU4278						4906	16.9	10.8	0.6	2.5	
EU4300	1588	27.8	15.8	0.2	2.6	1577	12.0	9.5	0.4	2.5	
EU4316	2106	32.0	17.5	0.1	2.6	3655	16.1	14.0	0.4	2.4	
EU4321	2564	28.9	16.4	0.2	2.6	3904	12.2	11.2	0.1	2.5	
EU4387						3031	15.3	9.9	0.2	2.5	
EU4392	1773	29.6	16.4	0.4	3.0	4086	13.0	11.2	0.1	2.5	
EU4426	1374	27.0	14.7	0.1	2.8	9329	12.4	8.4	0.4	2.4	
EU4444	601	21.7	12.7	0.0	2.4	10144	11.8	8.6	0.5	2.5	
EU4450	1962	30.6	16.1	0.3	2.7	3568	12.3	12.1	0.3	2.5	
EU4463						2282	17.9	12.9	0.2	2.6	
EU4473	1643	30.7	15.5	0.3	2.7	3023	8.7	7.6	0.2	2.1	
EU4491						3120	16.4	12.0	0.2	2.8	
EU4508	1828	32.0	17.1	0.2	2.6	3434	12.7	12.2	0.1	2.0	
EU4519	394	19.8	13.8	0.2	2.1	8365	11.5	8.7	0.3	2.4	
EU4532	263	22.0	16.2	0.2	3.0	2339	16.1	12.1	0.4	2.7	
EU4540	899	25.3	14.7	0.4	3.0	5152	14.9	11.2	0.1	2.6	
EU4565						3781	16.8	11.2	0.1	2.6	
EU4573	758	24.2	14.2	0.3	2.6	12973	12.3	9.4	0.2	2.5	
EU4579	1358	24.2	14.8	0.5	3.1	7598	14.2	11.8	0.3	2.6	
EU4582	952	24.5	13.6	0.2	2.9	15068	11.8	9.2	0.2	2.4	
EU4589	178	27.8	16.7	0.4	2.6	368	10.5	7.4	0.7	2.4	
EU4591	904	22.2	14.0	0.1	2.4	8422	10.9	8.4	0.4	2.3	
EU4593	1872	25.0	14.3	0.1	2.5	5711	14.7	11.0	-0.1	2.4	
EU4607	790	21.9	13.8	0.2	2.6	8372	11.2	8.7	0.4	2.4	
EU4623	1313	27.0	15.0	0.4	2.9	7328	15.0	11.8	0.3	2.7	
EU4650	1006	25.4	15.6	0.4	2.8	6927	15.3	11.7	0.1	2.7	
EU4685	5215	24.0	14.8	0.1	2.2	2241	16.0	12.5	0.2	2.2	
EU4687	1374	26.5	14.8	0.2	3.1	7773	14.9	12.1	0.2	2.6	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU4710	1125	26.7	13.6	0.5	3.1	5644	15.8	12.5	0.4	2.6	
EU4721	420	21.4	15.0	0.0	2.4	4185	12.1	9.4	0.4	2.6	
EU4723	994	25.9	13.8	0.3	3.0	5771	15.9	11.3	0.2	2.8	
EU4773	137	29.7	16.6	-0.1	3.2	899	17.1	14.3	0.6	2.7	
EU4792	741	20.1	12.2	0.2	2.6	3675	12.4	9.5	0.1	2.5	
EU4824	1080	23.9	15.5	0.4	2.9	6277	14.1	11.5	0.3	2.6	
EU4833	1334	24.2	13.8	0.4	2.8	6849	14.4	11.7	0.2	2.5	
EU4838						4481	16.0	10.9	0.3	2.6	
EU4853	498	21.3	13.0	0.1	2.9	9304	11.7	8.6	0.3	2.4	
EU4864	1248	24.9	14.3	0.2	3.1	7137	15.6	12.5	0.3	2.9	
EU4950	747	18.5	9.1	0.1	2.4	4411	10.9	8.0	0.2	2.3	
EU4954	1163	24.4	13.4	0.2	2.7	6599	14.8	10.9	0.3	2.6	
EU4976	1204	25.0	15.9	0.3	2.6	6134	14.5	12.1	0.2	2.6	
EU5050	1047	25.1	14.6	0.5	2.9	6569	14.8	11.8	0.3	2.7	
EU5073	1303	24.4	14.5	0.4	2.7	7830	14.6	11.6	0.2	2.7	
EU5098						4405	18.0	11.9	0.4	2.7	
EU5129	6884	22.9	14.4	0.1	2.3	2531	13.8	8.6	0.3	2.1	
EU5134						142	11.7	10.4	1.1	1.9	
EU5182	94	27.1	13.3	0.2	3.4	463	12.8	8.5	0.7	2.8	
EU5185	1253	24.8	15.2	0.4	2.9	7318	13.9	11.2	0.1	2.6	
EU5261	1309	24.3	13.8	0.1	2.8	7776	15.1	12.0	0.3	2.7	
EU5264	1253	24.7	12.8	0.2	2.9	6237	14.9	11.7	0.0	2.6	
EU5318	1173	22.7	14.2	0.2	2.8	5368	14.0	11.9	-0.1	2.5	
EU5331	1693	25.0	13.8	0.3	2.5	5369	15.1	11.9	-0.2	2.5	
EU5349						4799	17.4	12.1	0.2	2.7	
EU5351	1386	24.9	14.6	0.2	2.7	5128	12.9	10.2	0.1	2.3	
EU5397	6057	22.6	14.4	0.0	2.3	2392	14.9	9.4	0.2	2.0	
EU5420	1864	30.4	16.1	0.2	2.6	2611	13.3	12.2	0.4	2.5	
EU5429						12428	7.1	4.7			
EU5435	1161	24.8	14.3	0.3	2.7	4901	14.8	11.1	-0.2	2.4	
EU5441	841	18.3	11.4	0.1	2.2	3850	13.3	10.3	0.3	2.5	
EU5463	2630	24.0	15.4	0.2	2.2	3451	12.8	13.3	0.1	2.3	
EU5478	701	23.5	14.4	0.0	2.6	13774	11.7	9.5	0.2	2.4	
EU5486	1435	26.9	14.6	0.0	2.4	2149	14.0	12.4	0.0	2.4	
EU5511	1783	28.5	17.0	0.0	2.3	2996	13.2	13.4	0.1	2.6	
EU5529	789	21.7	12.7	0.0	2.3	14957	11.6	8.9	0.1	2.5	
EU5544	3188	35.3	17.0	0.0	2.8	6479	14.0	12.9	0.1	2.2	
EU5587	1252	25.0	14.2	0.3	2.8	4784	14.5	11.2	0.2	2.4	
EU5591	1342	29.6	16.7	0.4	3.0	9176	12.1	8.1	0.3	2.4	
EU5593	910	22.6	15.3	0.1	2.9	1605	8.9	6.1	0.4	2.7	
EU5601						3361	15.3	10.3	0.2	2.6	
EU5612	649	22.8	15.3	0.3	2.3	7152	11.6	9.0	0.3	2.3	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU5613	1407	24.5	13.7	0.1	2.5	4991	12.7	9.6	0.0	2.5	
EU5635	2795	32.0	15.6	0.0	2.6	5643	12.0	11.7	0.2	2.1	
EU5643	965	21.2	12.7	0.2	2.4	6852	11.5	9.0	0.2	2.5	
EU5719	959	31.5	15.3	0.2	2.7	733	10.6	10.8	0.0	2.4	
EU5820	554	27.4	15.0	0.3	2.5	723	9.8	8.5	0.1	1.8	
EU5891	1223	24.7	13.8	0.1	2.7	4965	13.9	10.5	0.0	2.5	
EU6000	329	19.0	13.0	-0.2	2.8	3482	16.6	11.4	0.5	2.6	
EU6021	3492	22.1	13.0	0.1	2.5	3694	8.2	8.2	0.0	1.9	
EU6053	2257	22.9	13.1	0.1	2.2	2434	7.9	7.3	0.0	1.3	
EU6094	2094	22.4	13.1	0.1	2.4	2164	8.3	6.6			
EU6113	3462	26.0	15.3	0.2	2.3	1483	12.4	7.5	0.2	2.2	
EU6127	2622	22.3	13.2	0.1	2.3	2738	8.4	7.5	0.0	1.4	
EU6148	1382	22.5	13.1	0.1	2.5	1576	10.7	8.7			
EU6188	1283	24.4	14.6	0.1	2.6	1453	9.8	8.0	0.0	1.9	
EU6200	237	24.1	16.0	0.1	2.0	236	6.8	4.1			
EU6264	454	20.3	12.4	-0.1	2.5	9522	11.3	8.4	0.3	2.5	
EU6287						4430	17.7	12.0	0.4	2.6	
EU6349	622	26.3	13.9	0.1	2.6	3230	11.6	9.8	0.2	2.3	
EU6386	1553	29.2	15.8	0.2	2.8	10550	12.5	8.4	0.4	2.4	
EU6444	530	20.8	12.0	0.0	2.4	6318	11.4	8.6	0.3	2.8	
EU6524	3054	27.2	15.5	0.3	3.2	14199	11.9	8.5	0.5	2.5	
EU6527	867	21.7	13.0	0.1	2.6	3947	12.3	9.6	0.3	2.5	
EU6544	1923	24.8	13.6	0.2	2.6	6469	15.2	12.4	0.0	2.5	
EU6556	1845	24.3	13.7	0.2	2.7	5158	13.7	11.5	0.0	2.4	
EU6564	2034	24.1	12.6	0.2	2.7	6577	13.8	10.7	-0.1	2.3	
EU6723	2020	26.5	14.4	0.0	3.2	10660	12.2	8.1	0.5	2.6	
EU6735	1790	24.1	13.5	0.1	2.6	5925	14.2	11.4	-0.1	2.4	
EU6743	1246	24.5	14.2	0.2	2.7	4872	14.3	11.6	-0.1	2.5	
EU6870	516	28.7	13.4	0.2	2.6	1467	9.1	7.1	0.3	1.8	
EU6890	648	22.2	12.3	-0.1	2.2	3308	11.7	8.9	0.2	2.3	
EU6900	32	30.3	14.6	0.1	2.5	101	8.8	9.5			
EU6923						4646	15.6	11.6	0.5	2.5	
EU7001	890	22.8	11.8	0.1	2.5	3637	14.3	11.0	0.0	2.4	
EU7082						4283	16.1	12.5	0.4	2.6	
EU7119	443	19.3	13.0	0.2	2.7	2935	15.5	11.2	0.5	2.6	
EU7218	852	23.5	10.9	0.0	2.7	3650	14.0	10.3	0.5	2.7	
EU7285						4213	16.5	12.6	0.2	2.8	
EU7293	1299	25.7	14.9	0.3	2.8	4182	13.5	10.3	0.1	2.4	
EU7314	1700	25.9	15.0	0.3	2.9	5212	14.5	11.7	0.1	2.4	
EU7382	1545	23.2	13.5	0.2	2.7	5060	13.2	10.0	0.2	2.4	
EU7412	1601	24.3	13.4	0.2	2.8	5216	15.1	10.9	0.1	2.4	
EU7427	1729	25.8	14.0	0.4	2.6	5564	13.4	10.5	0.1	2.3	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU7521						4949	17.2	12.0	0.4	2.7	
EU7536	1222	24.1	13.8	0.3	2.9	4486	14.2	10.1	0.1	2.6	
EU7610	1206	25.0	14.3	0.4	2.7	7846	15.3	11.7	0.4	2.6	
EU7629	866	20.4	11.6	0.1	2.6	3568	12.2	9.3	0.1	2.7	
EU7634						4145	16.4	10.6	0.5	2.3	
EU7635	179	17.1	14.9	-1.5	4.4	518	21.1	15.4	0.7	3.0	
EU7643	834	24.1	13.9	0.1	2.8	3704	11.4	8.9	0.0	2.4	
EU7654	444	22.6	11.5	0.3	2.6	2573	12.9	9.7	0.1	2.4	
EU7724	1078	21.1	12.3	0.1	2.4	4272	12.7	9.7	0.2	2.4	
EU7864	2230	29.6	18.0	0.1	2.9	1428	9.5	8.6	0.0	2.3	
EU7865						4325	18.2	12.8	0.3	2.6	
EU7866	1060	27.7	13.9	0.3	2.8	3515	12.8	8.6	0.6	2.5	
EU7888	478	20.9	12.2	0.1	2.2	8898	11.3	8.2	0.3	2.4	
EU7894	393	19.1	12.9	0.0	2.6	4228	16.5	11.2	0.6	2.7	
EU7910	1000	21.1	14.6	0.1	2.7	6822	14.0	10.1	0.3	2.5	
EU8264						2917	16.6	12.1	0.5	2.5	
EU8431						4645	15.9	11.6	0.4	2.7	
EU8478						3890	15.6	12.1	0.3	2.8	
EU8520	348	19.5	11.8	0.2	2.9	3479	11.9	9.7	0.4	2.5	
EU8598						1257	15.8	13.0	0.3	2.5	
EU8605						4343	16.9	11.6	0.2	2.5	
EU8632						5691	17.5	12.1	0.4	2.7	
EU8733	1854	24.9	14.5	0.1	2.7	6025	13.5	11.5	-0.1	2.5	
EU8736						902	21.7	14.7	-0.5	3.4	
EU8742	1999	25.8	14.5	0.4	2.7	5668	13.8	11.1	0.1	2.5	
EU8787	1047	26.1	14.9	0.3	2.9	5261	14.0	10.9	-0.1	2.6	
EU8789						2145	15.5	11.2	0.5	2.6	
EU8891						3859	16.7	11.2	0.5	2.5	
EU8943						5019	18.3	13.1	0.4	2.5	
EU8969	572	22.4	14.3	0.2	2.4	3448	11.6	9.6	0.4	2.5	
EU9013	1602	24.2	14.3	0.2	2.7	5611	13.3	11.0	0.2	2.4	
EU9023						3514	17.3	12.6	0.5	2.8	
EU9145	541	22.2	12.4	0.0	2.4	5005	13.8	9.9	0.2	2.7	
EU9158	790	21.4	13.5	0.1	2.5	12357	12.3	9.6	0.2	2.6	
EU9234	28	17.2	9.0	-0.5	1.2	323	7.9	4.6	0.6	2.0	
EU9245	134	16.3	9.0	0.1	2.4	1457	10.0	5.8	0.5	2.2	
EU9356						5317	16.7	11.5	0.1	2.5	
EU9378						3194	16.9	12.5	0.2	2.8	
EU9544	766	24.4	13.7	0.6	3.7	4769	11.7	9.4	0.2	2.7	
EU9622	815	20.5	12.5	0.0	2.3	9042	11.0	8.0	0.4	2.3	
EU9678						4507	15.9	12.0	0.4	2.8	
EU9680	1184	24.5	14.2	0.1	2.7	2212	12.6	9.9	0.2	2.6	

2004-I FF	Wind Speed Cruise level in m/s					Wind Speed Ascent & Descent in m/s					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
	EU9692						4401	16.9	11.9	0.3	2.6
	EU9723	1043	23.8	13.4	0.4	2.7	5137	16.0	11.5	0.0	2.5
	EU9729	1667	26.8	13.6	0.0	2.6	3113	11.8	9.5	0.4	2.3
	EU9734						3018	16.4	10.7	0.4	2.8
	EU9743	1708	22.6	12.5	-0.1	2.7	13385	11.9	9.4	0.2	2.5
	EU9883	1291	23.8	15.1	0.3	2.7	4926	14.4	11.3	0.1	2.3
	EU9967						3094	15.3	11.8	0.1	2.6

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c) Table 6, *Wind direction (deg)*

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU0002						5348				12	19
EU0006	1146			4	16	1215				3	13
EU0021	1223			7	11	9255				12	18
EU0022	1810			6	11	9373				13	20
EU0023	1533			3	9	1448				4	22
EU0032	2487			1	5	2451				8	21
EU0041	2007			6	10	6661				15	23
EU0042	255			5	5						
EU0043	1963			6	9	5566				14	21
EU0045	413			4	9	343				4	9
EU0046	1082			5	15	1258				4	30
EU0047	2094			7	10	7306				18	27
EU0049						4627				12	23
EU0051	2664			7	11	10998				15	22
EU0054	1449			8	13	6626				15	22
EU0055						4721				12	18
EU0059	1062			8	14	5841				15	23
EU0060	4279			2	8	1705				4	16
EU0061	1047			7	10	5222				14	21
EU0072	2613			6	7	11282				14	20
EU0080	1023			3	13	657				8	14
EU0081	2686			7	11	7458				13	18
EU0106	1287			7	12	6367				14	20
EU0109	2068			6	9	9046				14	21
EU0110	5745			3	10	2048				5	14
EU0123	182			4	6	187				7	12
EU0124						5015				11	18
EU0140	1072			3	8	1479				2	20
EU0158	1051			6	9	5072				13	20
EU0167	1424			6	10	5440				13	20
EU0185	1300			6	10	5141				15	24
EU0202	5839			4	9	1609				9	34
EU0204	3241			7	11	9703				13	20
EU0206	1466			3	9	1484				3	19
EU0230	2206			3	8	713				6	20
EU0233	1433			3	8	1250				2	23
EU0234						5186				13	21
EU0251	1167			7	11	6314				14	22
EU0263	1603			4	6	1106				12	18
EU0290	2009			3	9	1223				3	17

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU0299						3781				13	19
EU0301	1473			7	13	5387				17	28
EU0303	1026			7	12	5381				14	22
EU0307	1032			7	11	5541				14	22
EU0310	7194			3	9	1981				5	20
EU0311	1192			7	13	4376				13	20
EU0313	1517			7	11	5152				12	17
EU0316	2024			7	11	6213				14	23
EU0319	2030			6	9	6327				13	20
EU0324	3974			7	12	8883				13	21
EU0335	1953			3	9	1101				2	18
EU0350	1170			3	12	546				6	17
EU0359	987			7	12	4008				14	21
EU0367						5209				13	21
EU0373	1059			7	10	5458				15	23
EU0394	356			8	12	1877				16	22
EU0413	1293			7	11	5752				15	24
EU0432						5011				13	20
EU0442	938			8	13	4592				14	20
EU0445	41			6	7	579				13	20
EU0451	1566			3	9	1322				5	24
EU0453	7040			3	9	1955				5	18
EU0456	476			8	13	3641				11	15
EU0457	3427			4	9	817				2	13
EU0458	530			9	15	3863				12	18
EU0476	309			8	16	2662				12	20
EU0490	521			5	10	81				3	4
EU0511	1338			6	11	5992				15	22
EU0520	1863			3	9	1194				4	20
EU0558	1101			7	11	5191				13	20
EU0575	7272			3	10	2112				4	15
EU0576	2748			3	10	1640				5	23
EU0583	1247			6	9	6063				15	22
EU0601	1198			6	9	5222				13	18
EU0620						4697				14	22
EU0631	2026			3	11	1706				6	17
EU0676	952			7	11	5685				15	24
EU0700	309			5	5						
EU0707						3623				13	19
EU0720	267			9	18	1015				19	29
EU0802	1157			6	9	4525				13	18
EU0807	3090			7	11	13204				16	24

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU0810	909			7	10	5627			13	20	
EU0830	48			8	7						
EU0875	1207			7	12	4597			12	18	
EU0902	114			4	4						
EU0921	1196			8	13	5537			15	22	
EU0942	1212			3	8	925			3	31	
EU0947	858			4	12	682			5	14	
EU0970	605			4	6						
EU1001						5443			12	19	
EU1012	1219			3	8	609			1	9	
EU1035	1587			4	12	956			6	26	
EU1054	2115			3	9	1027			2	14	
EU1056						3373			13	20	
EU1115	1341			5	7						
EU1230	215			4	5						
EU1232	1312			3	8	829			1	14	
EU1234	1402			7	10	5921			14	22	
EU1259	873			5	9						
EU1282	5539			3	7	913			0	18	
EU1301	8630			4	9	4476			6	18	
EU1312	4377			4	9	2146			6	16	
EU1320	2017			3	9	1167			4	21	
EU1334	4616			4	12	665			0	8	
EU1337	140			13	19	897			10	12	
EU1345	506			8	16						
EU1346	1806			3	13	948			4	12	
EU1367	61			4	3						
EU1411	2801			4	7	310			2	7	
EU1436	456			5	8						
EU1437	1786			3	10	1105			4	25	
EU1498	1190			7	13	6347			14	20	
EU1532						41			22	62	
EU1538	1635			3	10	1193			6	20	
EU1547	1305			7	10	5623			14	20	
EU1567						4738			11	18	
EU1593	1407			4	8	1210			14	25	
EU1599	1699			3	10	1676			3	21	
EU1635	1753			3	9	1608			2	13	
EU1666	1706			3	7	1211			1	7	
EU1673	1420			6	9	7709			15	23	
EU1688	2135			7	10	11075			16	26	
EU1698						4717			10	17	

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU1700	1208			4	14	1103			8	41	
EU1731	1041			3	7	1370			3	14	
EU1790	1185			6	10	11502			15	25	
EU1800	864			8	18	6346			13	20	
EU1929	2685			4	8	415					
EU1976	372			6	10						
EU2017	909			6	10	3802			12	18	
EU2020	844			8	14	6767			14	23	
EU2043	4388			4	10	1380			5	20	
EU2055	789			7	12	3168			14	21	
EU2120	794			6	8	5722			13	21	
EU2123	92			5	5						
EU2165	1224			7	12	6119			12	19	
EU2189	1316			8	12	5125			13	21	
EU2200	6121			3	9	1688			4	15	
EU2201	1150			7	10	5125			16	24	
EU2235	988			8	15	7643			12	20	
EU2247	1160			7	11	5337			14	21	
EU2276	986			5	6						
EU2301	1534			6	9	5661			15	23	
EU2356	640			2	5	513			11	16	
EU2360	915			8	12	6748			14	22	
EU2378						2591			12	20	
EU2390						4889			11	17	
EU2400						3866			14	23	
EU2405	793			8	13	8484			12	19	
EU2407	200			4	5						
EU2429	523			5	7						
EU2450						3363			13	22	
EU2454	476			5	6						
EU2473	66			4	3						
EU2491	143			7	12						
EU2495	529			7	11	6227			11	18	
EU2512	397			8	11	5878			12	19	
EU2532						3320			13	21	
EU2535	25			2	2						
EU2559	1594			7	11	5978			15	23	
EU2595	1134			4	7	2855			3	18	
EU2610	1525			5	8	3198			6	18	
EU2622	643			7	9	6735			11	17	
EU2627						2817			12	19	
EU2630	758			7	10	3713			14	22	

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU2673	725			7	19	1087			6	39	
EU2690	806			8	13	8205			12	19	
EU2717	594			7	11	8057			11	16	
EU2751	9691			3	10	3738			5	18	
EU2752	745			8	14	9766			12	19	
EU2773	3599			3	9	659			2	17	
EU2792	863			7	11	8965			11	17	
EU2794						2626			14	24	
EU2795	3390			4	8	649					
EU2800	706			7	12	9371			12	18	
EU2829	539			6	8	6114			11	16	
EU2845	841			6	10	2604			15	22	
EU2846	739			7	11	9124			13	20	
EU2883						2635			12	19	
EU2897	672			7	13	7205			13	20	
EU2905	468			6	10	4202			14	22	
EU2912	1324			7	10	9770			14	20	
EU2936	917			7	11	6520			13	21	
EU2979	1043			8	14	7519			13	20	
EU2983	914			8	14	6565			14	23	
EU2984	1413			7	12	2821			17	27	
EU3000	1235			7	13	5215			13	20	
EU3042	1098			7	11	5360			13	21	
EU3048	1043			6	12	5715			12	20	
EU3075	3582			4	11	717			2	18	
EU3094	5055			3	9	1457			8	17	
EU3096	997			7	11	6809			13	19	
EU3113	83			4	5						
EU3114	985			8	15	7313			13	20	
EU3115	971			8	15	7451			14	22	
EU3125	714			5	6						
EU3147	3282			4	11	543			1	18	
EU3169	293			4	4						
EU3181	127			4	4						
EU3194	887			7	13	6578			12	19	
EU3201	1033			7	11	7138			13	20	
EU3250	885			8	12	6950			15	22	
EU3257	1219			8	14	5929			15	24	
EU3260	950			7	10	5813			13	20	
EU3265						2979			13	20	
EU3268	1663			7	11	2564			16	25	
EU3270						5452			12	19	

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU3293	827			10	17	6962			13	19	
EU3311	586			8	12	3746			12	20	
EU3317	705			7	13	5583			15	25	
EU3321	847			7	14	4668			15	26	
EU3358						4838			13	21	
EU3362	973			8	15	6692			12	18	
EU3375	969			7	11	6007			14	21	
EU3400	993			9	13	6030			15	24	
EU3421	1985			6	11	5863			14	22	
EU3455	1208			7	12	7149			15	24	
EU3469						4954			12	20	
EU3472	1000			6	10	6287			15	22	
EU3484	1061			7	13	7915			14	23	
EU3527	972			7	13	6254			14	23	
EU3544	52			11	18	214			20	22	
EU3598	421			11	19	3677			11	16	
EU3599	372			12	21	4223			13	17	
EU3621						4811			12	20	
EU3633	1757			4	9	2426			4	16	
EU3647	905			7	10	5209			12	18	
EU3654	434			8	14	8112			19	28	
EU3660	1829			4	8	2170			7	23	
EU3701	1459			3	5	2327			4	17	
EU3703	2490			6	8						
EU3714						5852			14	22	
EU3725	3170			4	9	350					
EU3733	1257			4	9	1948			2	17	
EU3747	106			3	3						
EU3755						2353			10	16	
EU3768	1837			3	6	2508			5	16	
EU3769	618			6	10						
EU3781	430			4	5						
EU3815	853			6	9						
EU3824	2045			4	9	3363			6	23	
EU3837	307			4	5						
EU3859	430			5	6						
EU3874	3034			4	10	630					
EU3908	745			6	9	12478			16	26	
EU3953	1761			4	11	3553			3	29	
EU3961	460			3	5	1053			8	16	
EU3972						3228			12	18	
EU3992	1277			4	8	1597			4	20	

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU4002	821			8	13	4486			16	25	
EU4004	935			3	6	1099			10	22	
EU4021						4464			10	17	
EU4035	592			5	8	483			6	9	
EU4066	1035			5	10	1715			7	24	
EU4075	1349			8	13	10829			16	26	
EU4083	1840			4	7	3367			7	21	
EU4112	1620			5	13	1488			9	25	
EU4137	1122			3	10	928			11	20	
EU4169	1033			4	12	1587			2	15	
EU4172	1024			3	8	971			10	24	
EU4205	1854			3	9	1204			7	19	
EU4235	1279			4	10	1236			7	21	
EU4264	1849			4	7	3530			7	24	
EU4278						4906			11	20	
EU4300	1588			3	11	1577			8	19	
EU4316	2106			4	6	3655			7	21	
EU4321	2564			4	8	3904			4	18	
EU4387						3031			11	17	
EU4392	1773			4	8	4086			6	18	
EU4426	1374			6	8	9329			13	20	
EU4444	601			8	10	10144			16	23	
EU4450	1962			4	6	3568			4	17	
EU4463						2282			14	24	
EU4473	1643			4	10	3023			6	23	
EU4491						3120			14	21	
EU4508	1828			4	7	3434			5	21	
EU4519	394			7	9	8365			17	24	
EU4532	263			14	28	2339			12	18	
EU4540	899			7	11	5152			14	24	
EU4565						3781			13	20	
EU4573	758			7	11	12973			16	25	
EU4579	1358			7	11	7598			14	23	
EU4582	952			7	13	15068			16	26	
EU4589	178			1	6	368			12	19	
EU4591	904			7	13	8422			16	24	
EU4593	1872			6	11	5711			14	22	
EU4607	790			7	12	8372			18	26	
EU4623	1313			7	15	7328			14	22	
EU4650	1006			7	10	6927			15	24	
EU4685	5215			5	9	2241			5	15	
EU4687	1374			7	13	7773			14	21	

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU4710	1125			6	10	5644			13	22	
EU4721	420			8	12	4185			15	25	
EU4723	994			7	11	5771			12	19	
EU4773	137			6	9	899			12	20	
EU4792	741			7	10	3675			17	27	
EU4824	1080			8	13	6277			16	24	
EU4833	1334			7	9	6849			14	23	
EU4838						4481			14	25	
EU4853	498			8	11	9304			17	25	
EU4864	1248			7	12	7137			14	23	
EU4950	747			7	9	4411			18	27	
EU4954	1163			6	10	6599			14	21	
EU4976	1204			7	11	6134			15	24	
EU5050	1047			8	14	6569			15	25	
EU5073	1303			7	11	7830			15	24	
EU5098						4405			10	14	
EU5129	6884			5	10	2531			5	18	
EU5134						142			15	13	
EU5182	94			7	7	463			14	21	
EU5185	1253			7	10	7318			15	25	
EU5261	1309			7	12	7776			14	23	
EU5264	1253			6	10	6237			13	20	
EU5318	1173			8	13	5368			14	22	
EU5331	1693			6	10	5369			13	19	
EU5349						4799			12	20	
EU5351	1386			7	10	5128			13	20	
EU5397	6057			6	12	2392			5	16	
EU5420	1864			4	8	2611			5	16	
EU5429						12428					
EU5435	1161			7	11	4901			12	18	
EU5441	841			8	11	3850			15	25	
EU5463	2630			6	11	3451			3	25	
EU5478	701			7	11	13774			16	25	
EU5486	1435			5	9	2149			4	14	
EU5511	1783			4	8	2996			4	25	
EU5529	789			7	12	14957			16	25	
EU5544	3188			3	8	6479			4	13	
EU5587	1252			7	9	4784			13	21	
EU5591	1342			6	10	9176			14	21	
EU5593	910			1	6	1605			9	23	
EU5601						3361			12	20	
EU5612	649			8	15	7152			16	24	

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU5613	1407			6	10	4991			15	23	
EU5635	2795			4	7	5643			5	19	
EU5643	965			10	17	6852			16	27	
EU5719	959			4	10	733			7	23	
EU5820	554			4	6	723			8	20	
EU5891	1223			7	11	4965			13	19	
EU6000	329			10	21	3482			11	18	
EU6021	3492			2	7	3694			0	13	
EU6053	2257			2	10	2434			1	27	
EU6094	2094			2	10	2164					
EU6113	3462			5	11	1483			5	21	
EU6127	2622			2	10	2738			0	5	
EU6148	1382			1	7	1576					
EU6188	1283			2	6	1453			1	13	
EU6200	237			2	13	236					
EU6264	454			8	10	9522			19	26	
EU6287						4430			13	23	
EU6349	622			5	6	3230			17	25	
EU6386	1553			6	9	10550			12	18	
EU6444	530			7	10	6318			17	26	
EU6524	3054			7	11	14199			16	24	
EU6527	867			8	13	3947			16	24	
EU6544	1923			6	9	6469			14	23	
EU6556	1845			7	11	5158			16	26	
EU6564	2034			6	8	6577			13	21	
EU6723	2020			7	13	10660			16	24	
EU6735	1790			7	11	5925			15	24	
EU6743	1246			7	12	4872			13	20	
EU6870	516			4	11	1467			8	22	
EU6890	648			7	12	3308			16	24	
EU6900	32			2	3	101					
EU6923						4646			14	23	
EU7001	890			7	14	3637			12	16	
EU7082						4283			13	20	
EU7119	443			13	24	2935			12	17	
EU7218	852			7	10	3650			15	24	
EU7285						4213			13	20	
EU7293	1299			7	12	4182			13	21	
EU7314	1700			6	9	5212			12	18	
EU7382	1545			7	12	5060			14	22	
EU7412	1601			7	10	5216			12	17	
EU7427	1729			6	10	5564			13	20	

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.					
	AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
			Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU7521						4949				12	19
EU7536	1222			7	10	4486				12	16
EU7610	1206			7	13	7846				13	21
EU7629	866			7	9	3568				17	26
EU7634						4145				11	18
EU7635	179			31	52	518				16	34
EU7643	834			7	10	3704				19	29
EU7654	444			6	7	2573				16	25
EU7724	1078			8	16	4272				13	22
EU7864	2230			4	13	1428				5	31
EU7865						4325				12	21
EU7866	1060			6	9	3515				14	22
EU7888	478			6	8	8898				16	23
EU7894	393			10	19	4228				11	15
EU7910	1000			7	14	6822				14	23
EU8264						2917				13	22
EU8431						4645				14	23
EU8478						3890				15	25
EU8520	348			7	10	3479				18	29
EU8598						1257				14	21
EU8605						4343				11	16
EU8632						5691				12	20
EU8733	1854			7	11	6025				16	24
EU8736						902				12	21
EU8742	1999			7	11	5668				14	23
EU8787	1047			7	11	5261				15	23
EU8789						2145				17	28
EU8891						3859				13	22
EU8943						5019				12	19
EU8969	572			7	13	3448				18	29
EU9013	1602			6	8	5611				16	25
EU9023						3514				14	24
EU9145	541			6	6	5005				14	24
EU9158	790			8	14	12357				16	26
EU9234	28			4	5	323				18	28
EU9245	134			9	11	1457				14	20
EU9356						5317				12	21
EU9378						3194				12	20
EU9544	766			7	9	4769				15	22
EU9622	815			7	10	9042				16	24
EU9678						4507				14	23
EU9680	1184			7	10	2212				16	24

2004-I DD	Wind Direction Cruise level in degrees					Wind Direction Ascent & Descent in deg.				
AIRCRAFT	Number of Reports	Observed		Obs-backgrnd		Number of Reports	Observed		Obs-backgrnd	
		Mean	SD	Mean	SD		Mean	SD	Mean	SD
EU9692						4401			13	20
EU9723	1043			7	13	5137			12	18
EU9729	1667			6	10	3113			20	32
EU9734						3018			11	17
EU9743	1708			7	13	13385			16	25
EU9883	1291			7	9	4926			13	21
EU9967						3094			14	21

[400]

Annex I. EU Amdar Observations from 24 – 26 March 2004.

In order to have a brief impression of the distribution of the locations of observations, three maps are presented. In fig. 6. Europe is presented with all EU Amdar observations for 24 – 26 March 2004. Note that most data is acquired during ascending or descending (ASC/DES: 77%, LVR/LVW: 23%). In figure 7. (next page), data from and around the Atlantic is displayed. AMDAR data is evaluated using HIRLAM numerical model data as background. This background reference is restricted by a limited area, shown in fig. 7. An impression of the global coverage of E-AMDAR observations is given by fig 8. In this figure also ASDAR and other AMDAR observations are presented (mainly Australia and New Zealand).

AMDAR COVERAGE 24 – 26 MARCH 2004

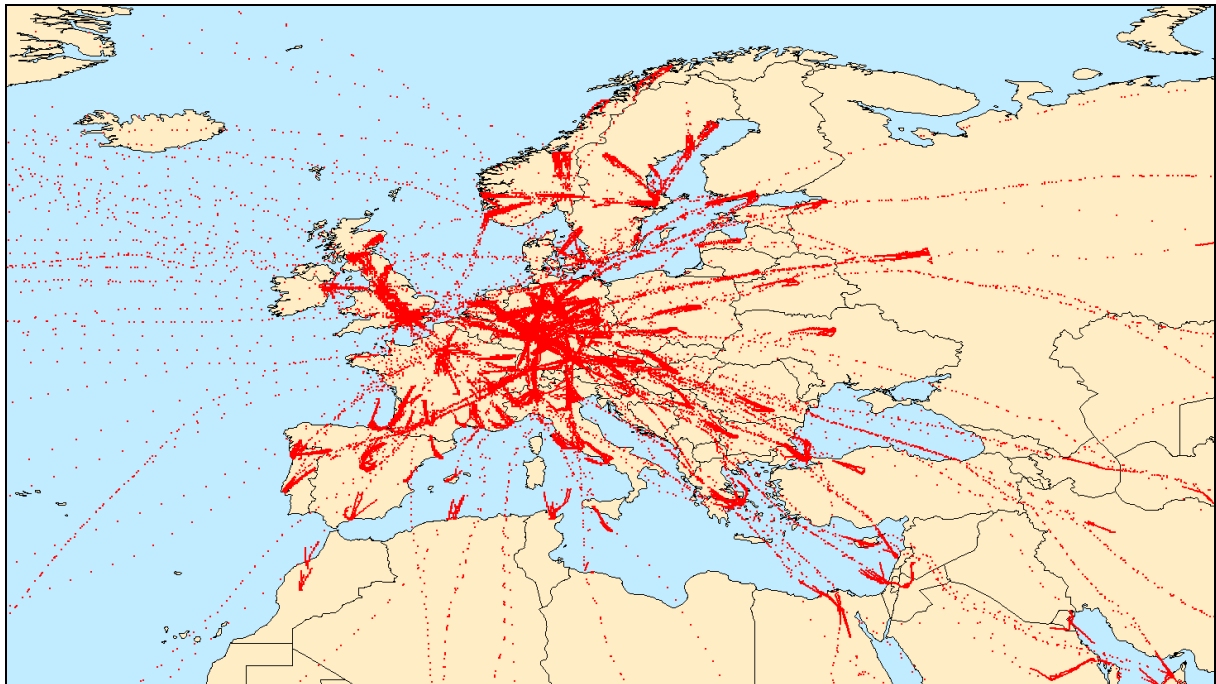


Fig. 6. All EU AMDAR observation locations, for the period 24 – 26 March 2004 and zoomed in over Europe.

AMDAR COVERAGE 24 – 26 MARCH 2004

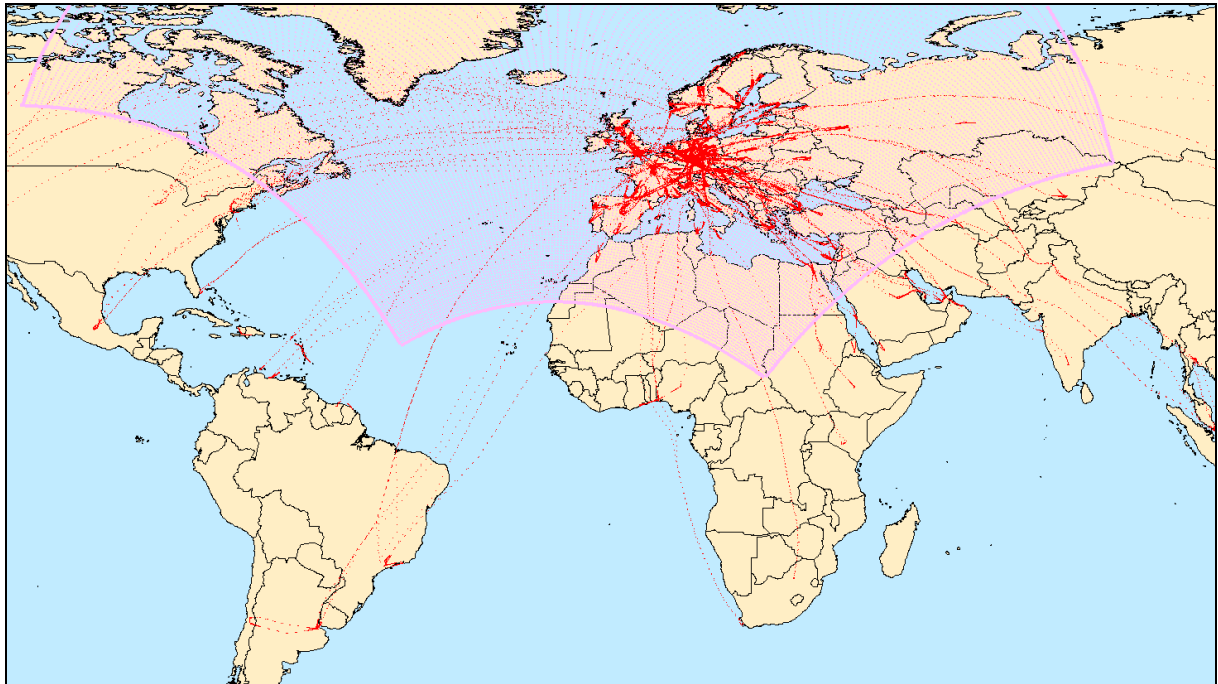


Fig. 7. All AMDAR observations locations for 24 – 26 March 2004. In this figure the Hirlam area used for the evaluation purposes is indicated ([pink box])¹ [see footnote]

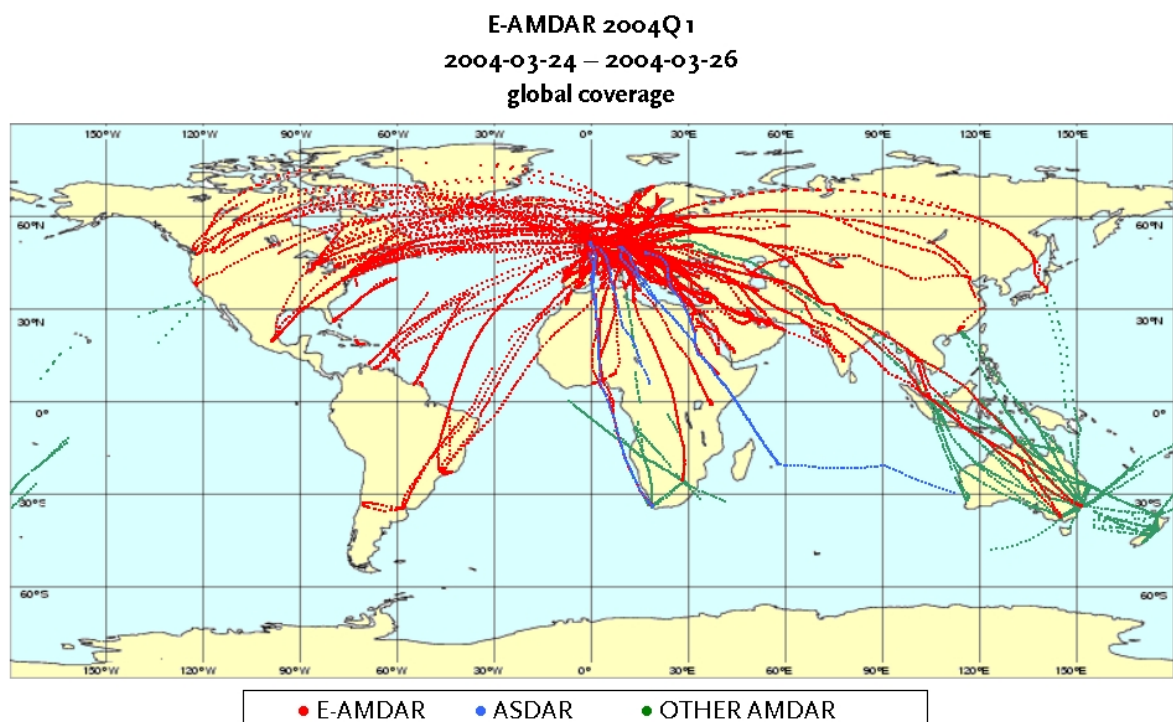


Fig. 8. Global coverage of E-AMDAR (●), ASDAR (●) and other AMDAR (●) observations. Period: 24 – 26 March 2004.

¹ Aircraft outside the HIRLAM area are evaluated by the E-AMDAR Technical Co-ordinator using other data sources.

Annex II. Frequency distribution of mean temperature, mean wind speed and wind direction differences.

In the figs. 9. to 12. distributions are presented for temperature, wind speed and direction. These distributions represent the mean differences of the set of 425 reporting E-AMDAR aircraft. In fact these figures show *bias* distributions. In this figures distinction is made between LVR/LVW (flight level, typically at higher altitudes) and ASC/DES (ascending and descending, typically at lower levels). Obviously the mean bias of the whole set of aircraft is altitude dependent (see also report 2003Q1). A cumulative plot based on the data in fig. 9. is given in fig. 10. Considering the medians of the two distributions, a difference is found of about +0,06 K.

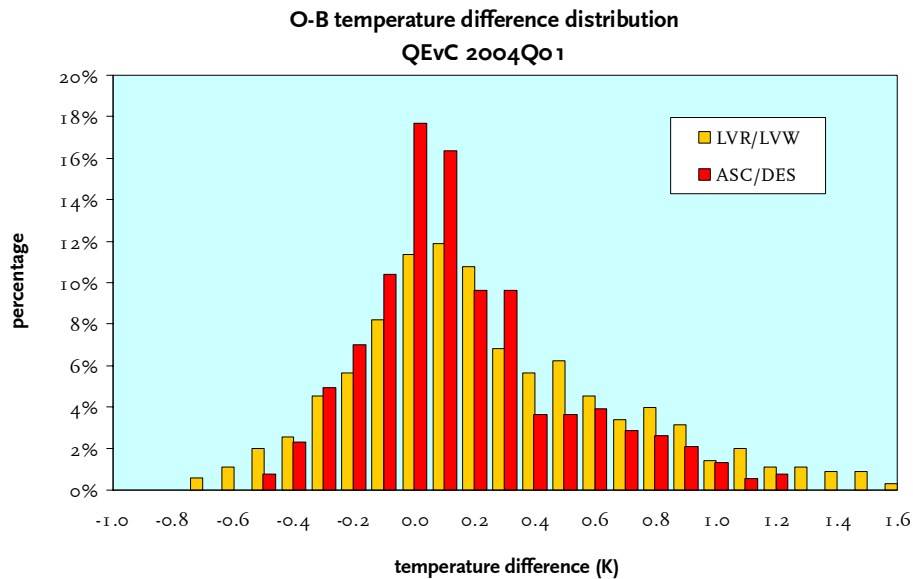


Fig. 9. Frequency distribution of the mean temperature difference (OBS–Background) for the number of aircraft reporting AMDAR reports ($N=425$). Distinction is made between the Flight Level (LVR/LVW) and the Ascending or Descending phase (ASC/DES). Clearly, there is a slight difference between the distributions of both phases. (see also next fig.)

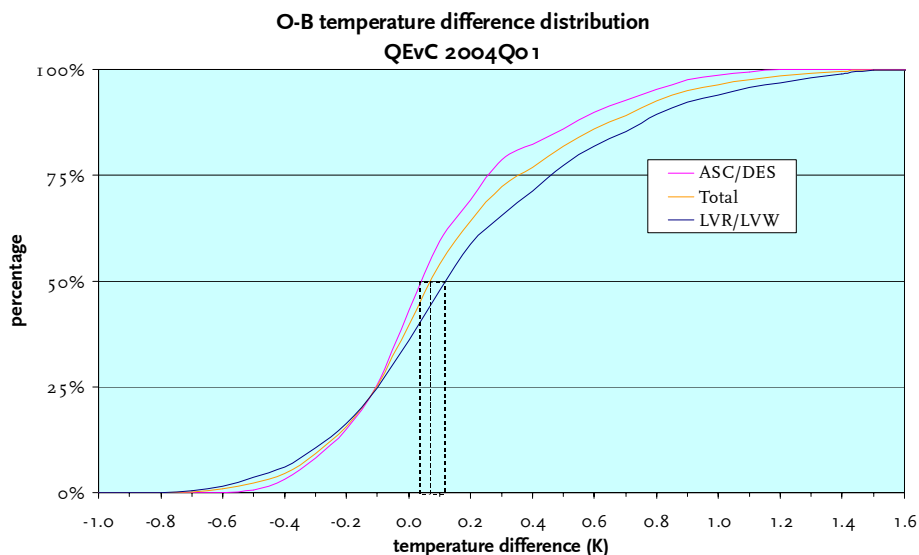


Fig. 10. Cumulative frequency distribution of the mean temperature difference (OBS–Background) for the number of aircraft reporting AMDAR reports ($N=425$). Distinction is made between the Flight Level (LVR/LVW) and the Ascending or Descending phase (ASC/DES). The difference between the distributions of both phases can be expressed by the median values (at 50%): $\Delta T[50\%; \text{ASC/DES}] = 0.05 \text{ K}$, $\Delta T[50\%; \text{LVR/LVW}] = +0.15 \text{ K}$, a difference of 0.10 K.

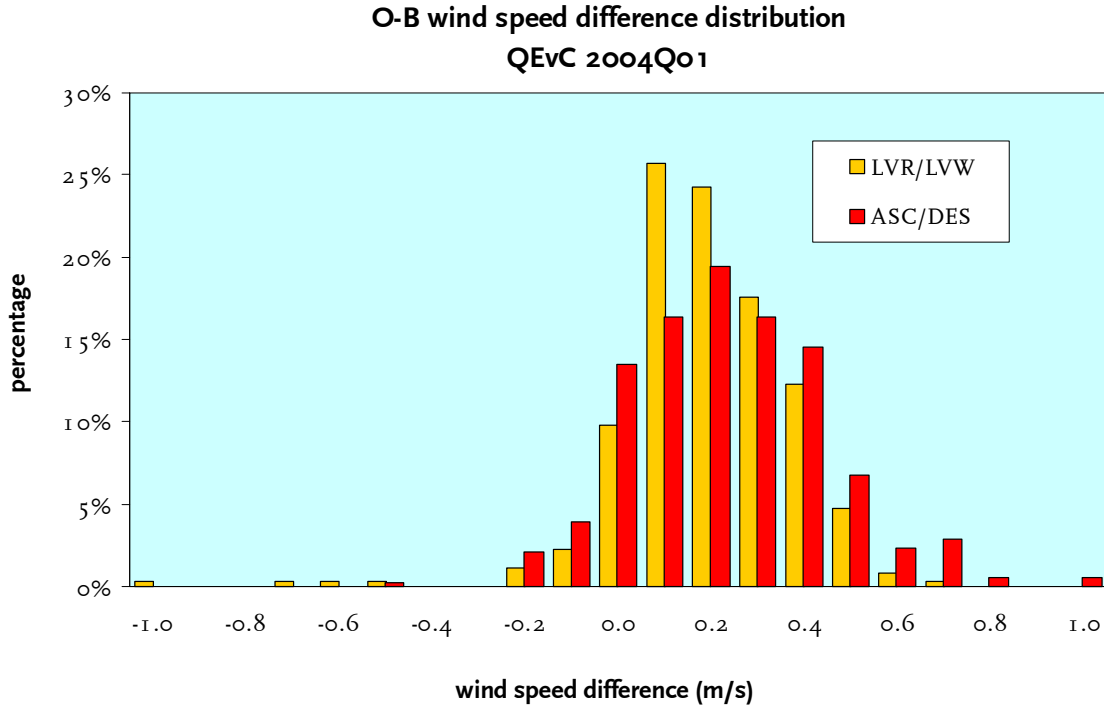


Fig. 11. Frequency distribution of the mean wind speed difference (OBS–Background) for the number of aircraft reporting AMDAR reports (N=425). Distinction is made between the Flight Level (LVR/LVW) and the Ascending or Descending phase (ASC/DES). Clearly, there is no significant difference between the distributions of both phases

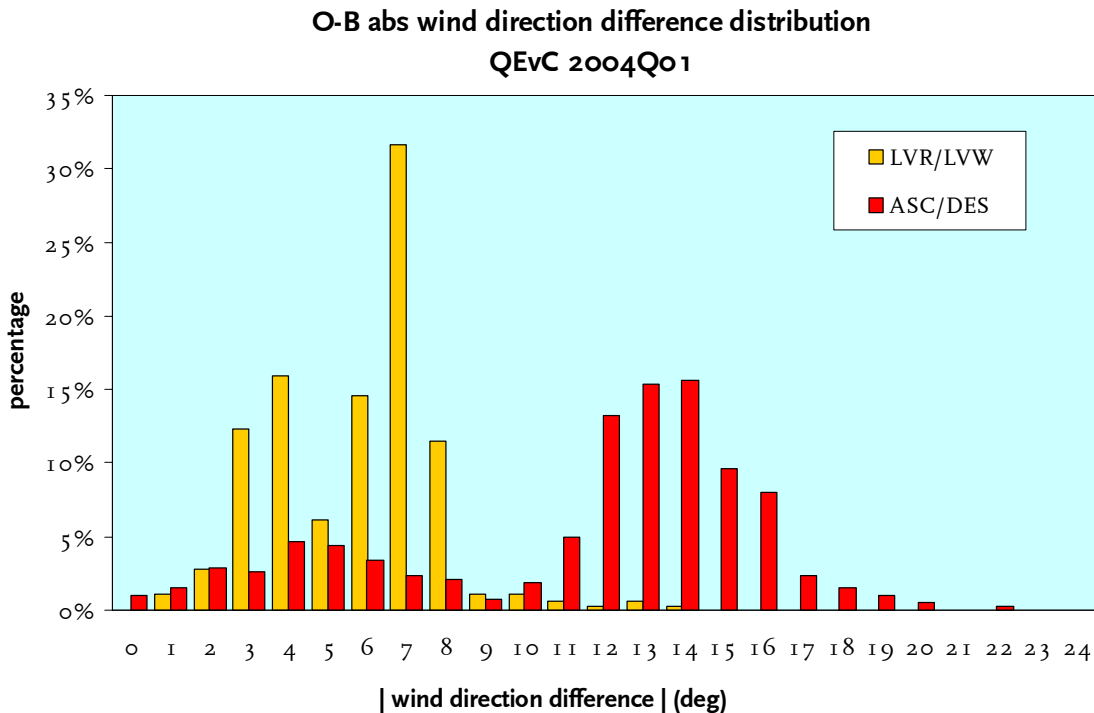


Fig. 12. Frequency distribution of the mean of the absolute wind direction difference (|OBS–Background|) for the number of aircraft reporting AMDAR reports (N=425). Distinction is made between the Flight Level (LVR/LVW) and the Ascending or Descending phase (ASC/DES). Clearly, in this case there is a significant difference between the distributions of both phases.

Annex III. Trend in the daily amount of observations.

The number of observations, received every day can be presented as a function of time (see fig. 13.). Such a figure will demonstrate the trend in this daily amount. The figure shows a very stable pattern. Notice the two curious dips on sat. Jan. 24th and sat. Febr. 28th.

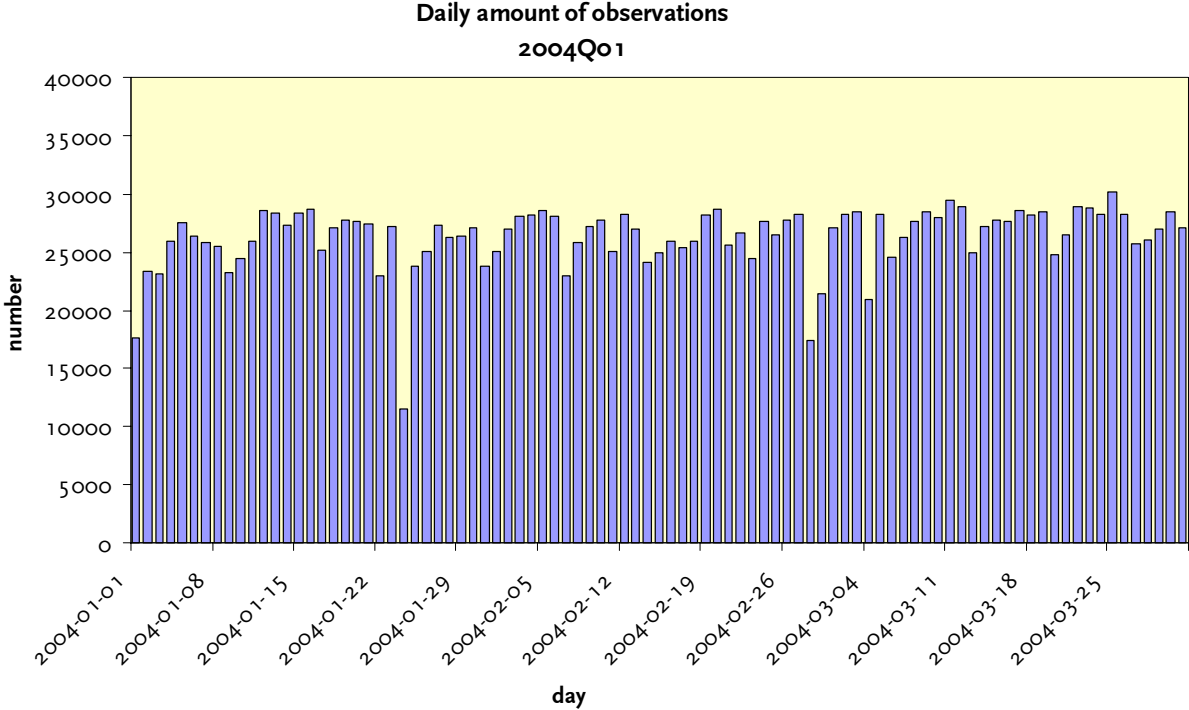


Fig. 13. The daily amount of EU-Amdar observations, evaluated after reception at De Bilt..

Annex IV. Trends in the mean O–B differences.

In fig 14, an overview is presented of the mean O–B air temperature differences ΔTA for each aircraft apart. Each EU aircraft is represented by a different colour/pattern. Using this method, it is clear to identify aircraft exceeding the defined error parameters. This figure shows some typical outliers, but in general the overall differences show a random behaviour, which is stable during the period.

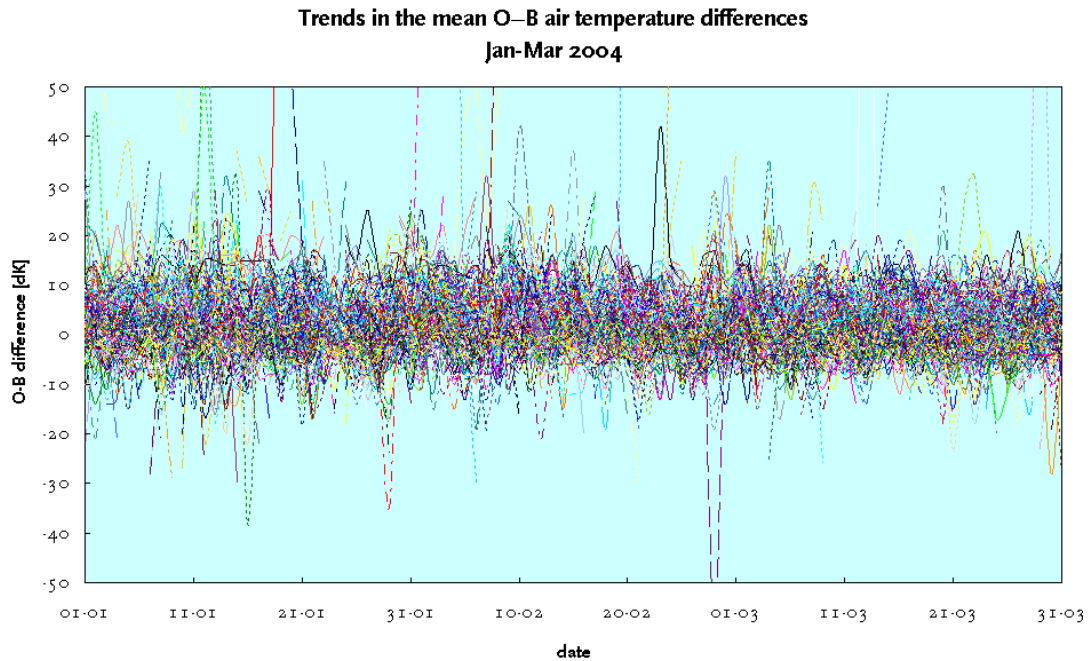


Fig. 14. Trends in the mean O–B air temperature differences (note: temperature-scale is in deci-Kelvin, /0.1 K). In general the differences demonstrate a rather random behaviour, as expected. Notice the typical outliers.

In fig. 15, a similar overview is presented for the wind speed differences ΔFF :

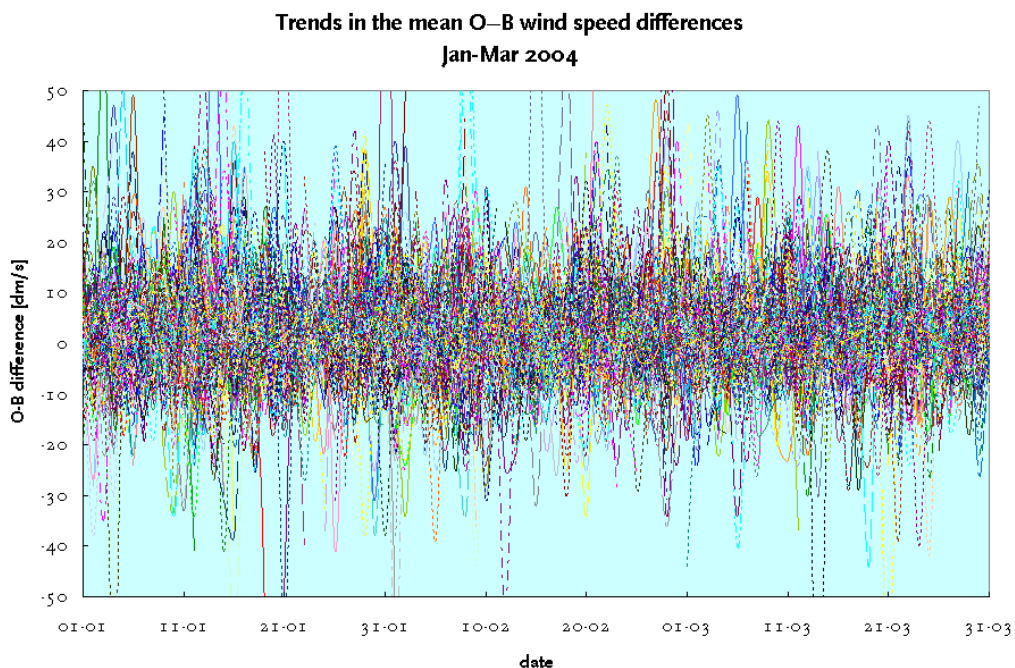


Fig. 15. Trends in the mean O–B wind speed differences (note: velocity-scale is in deci-metres per second, /dm.s⁻¹). Again, a rather random behaviour is found.

In fig. 16. a similar overview is presented for the wind direction differences (based on absolute values, i.e. $|\Delta DD|$):

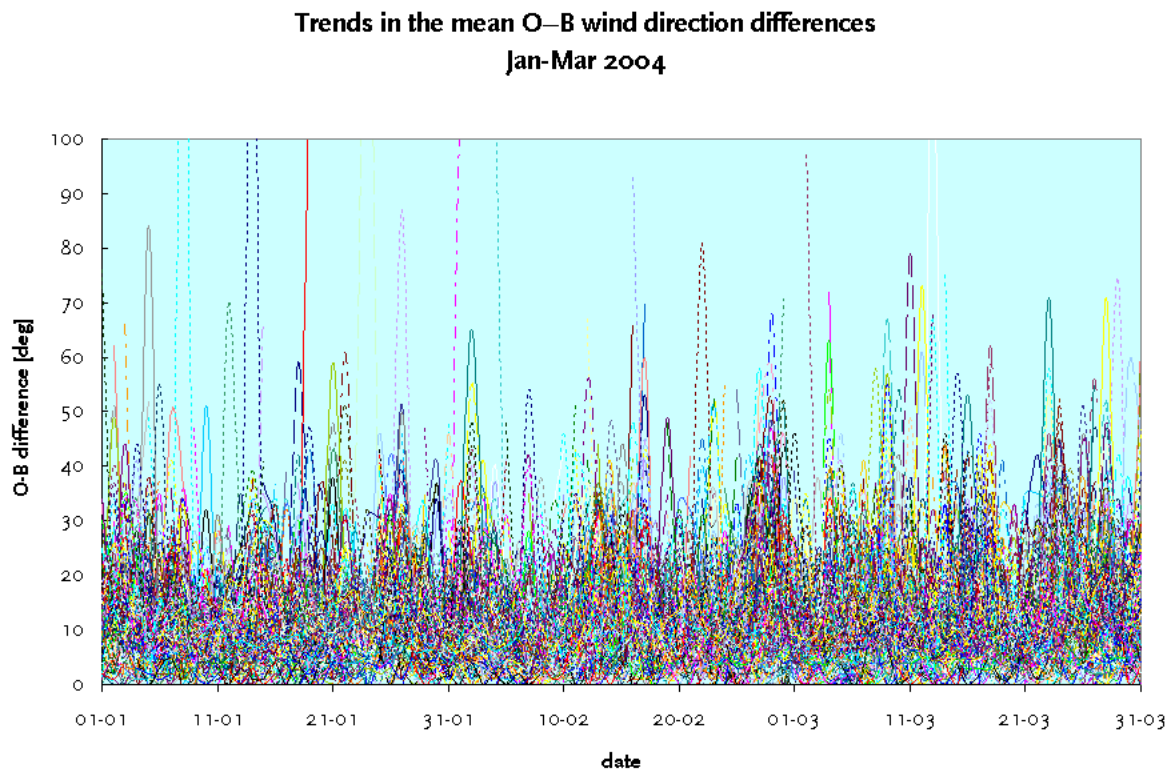


Fig. 16. Trends in the mean O–B wind direction differences. Like with the previous figures, in general the differences demonstrate a rather random behaviour.

Annex V. The daily cycle and observation times.

In the figures 17. to 20. the 'aircraft -number of observations' is presented for 11 March 2004 (for observations from aircraft: AIREP [•], AMDAR [•] and ACARS [•]). The figures give an impression of the trend in the availability of aircraft observations for use in the ECMWF models runs at 06, 12, 18 and 24 (00) UTC.

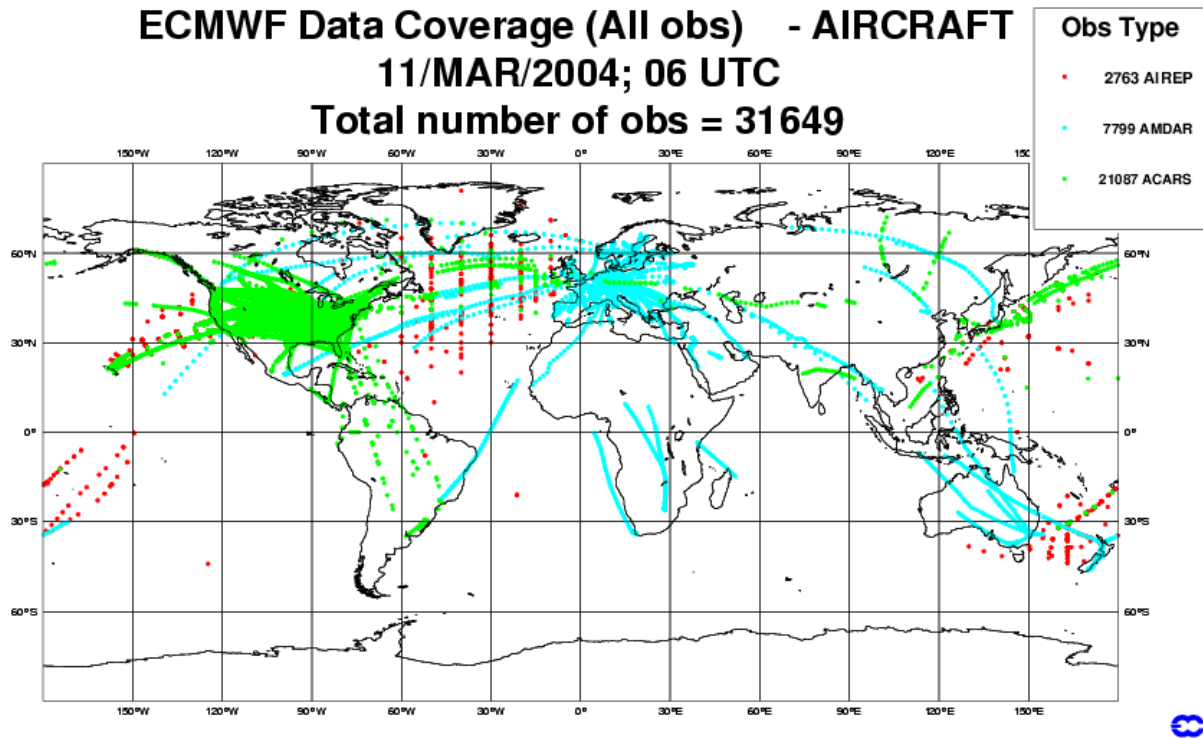


Fig. 17.

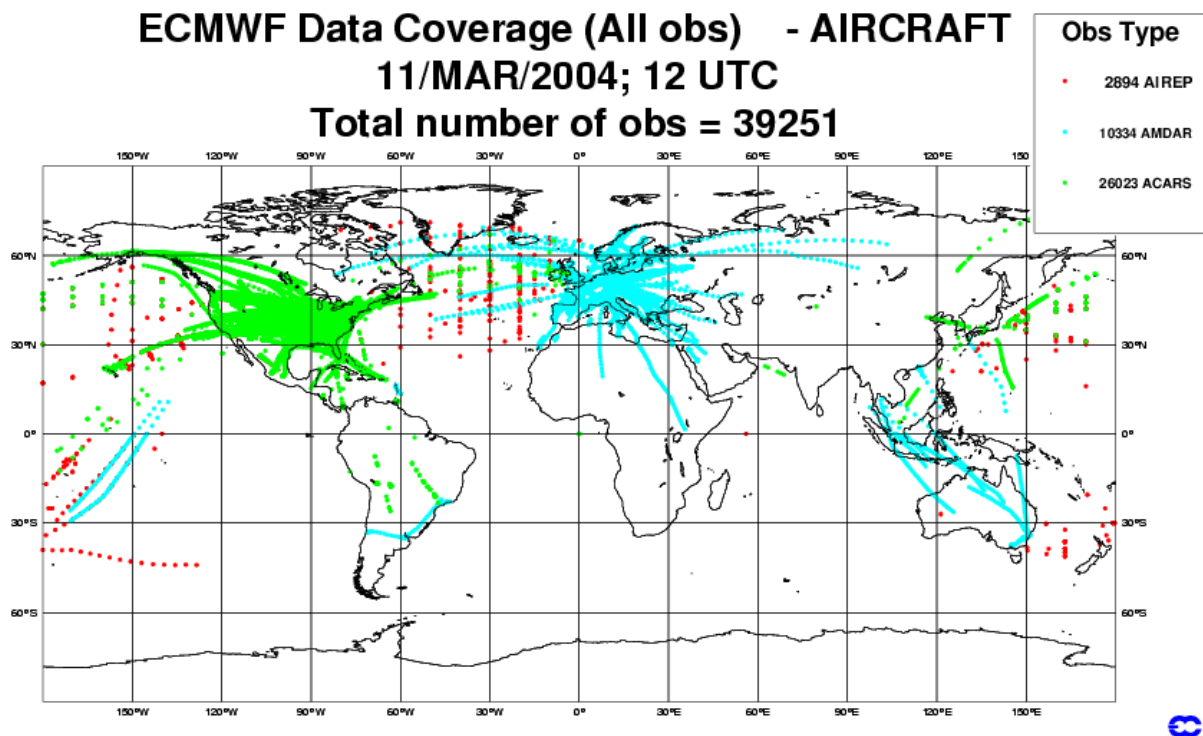


Fig. 18.

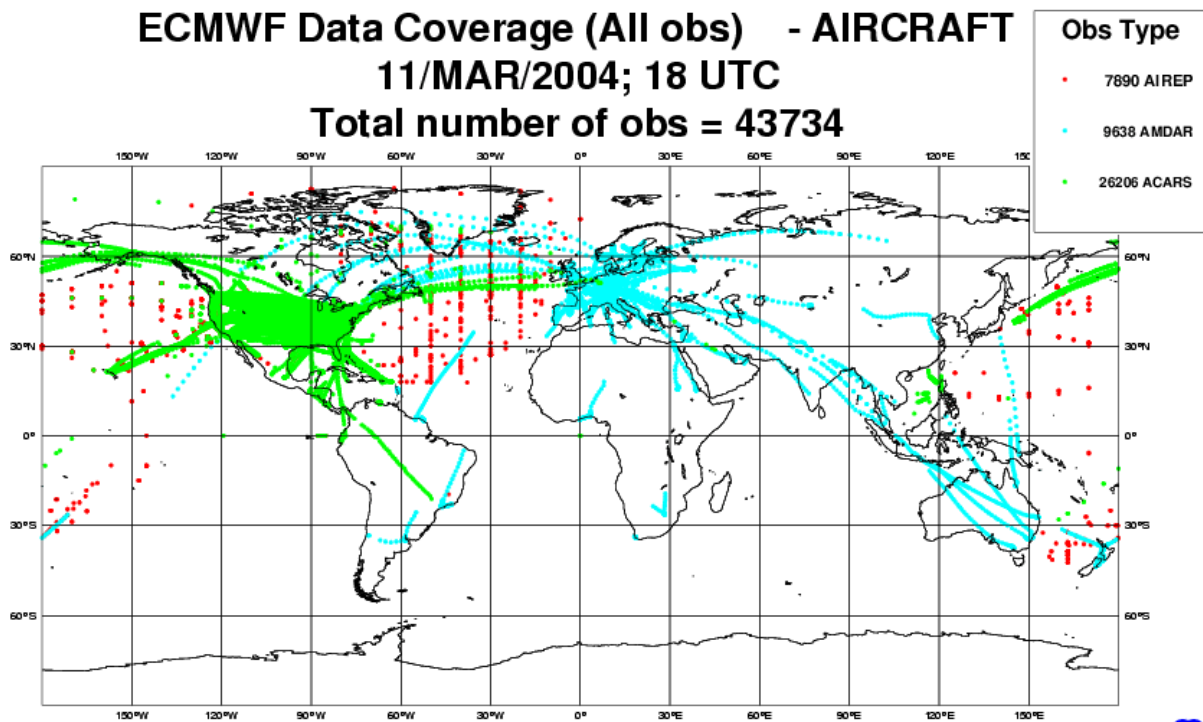


Fig. 19.

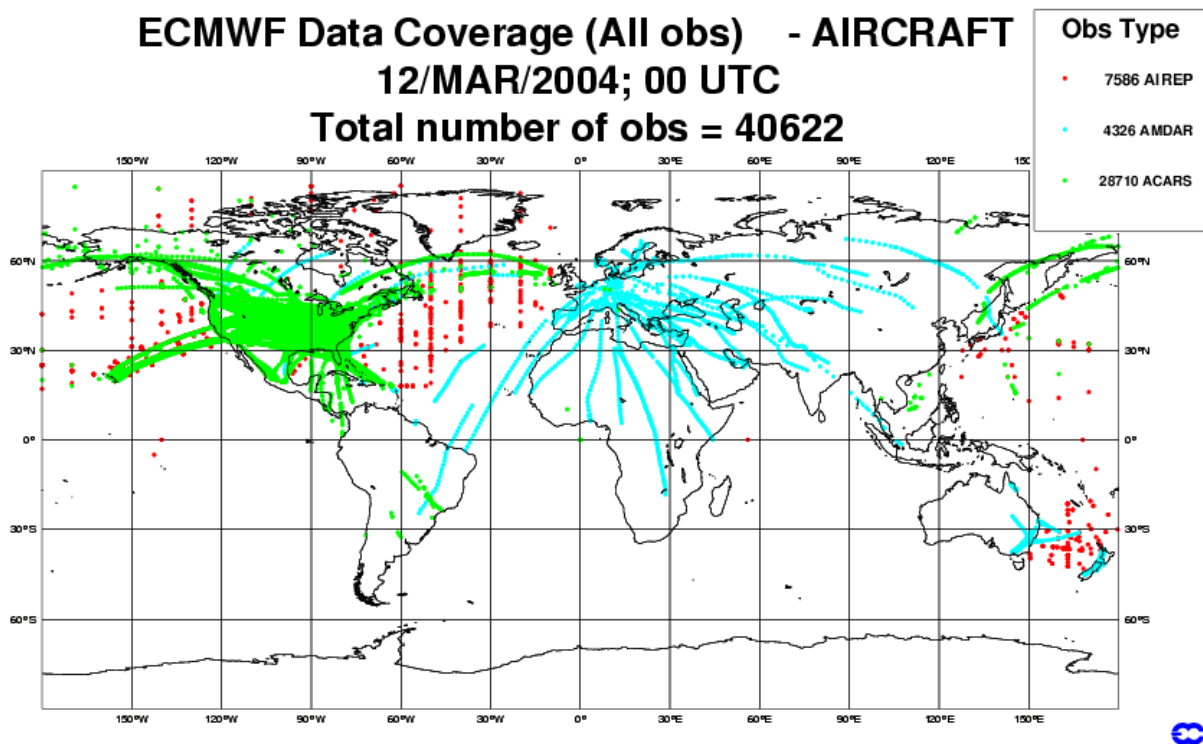


Fig. 20.

Obviously the European region is well covered with AMDAR data for the 06, 12, 18 UTC runs. Although a rather limited coverage for 00 UTC (midnight, local European Time \approx UTC) can be observed for the European region, a significant increase of observations around 00 UTC is recorded for the last year. Note that the long haul intercontinental flights give a global coverage, independent of time.



Annex VI. Case study: Frequency distribution of mean temperature differences by aircraft type

In [Annex II](#) a frequency distribution is presented of the mean temperature differences for the *whole* set of aircraft. For this distribution distinction is made between two classes of type of flight, *i.e.* LVR/LVW (flight level) and ASC/DES. In this case study further distinction is made between the various types of aircraft. For this purpose all aircraft are sorted by '*family of aircraft*' and the following selecting is made:

Airbus:

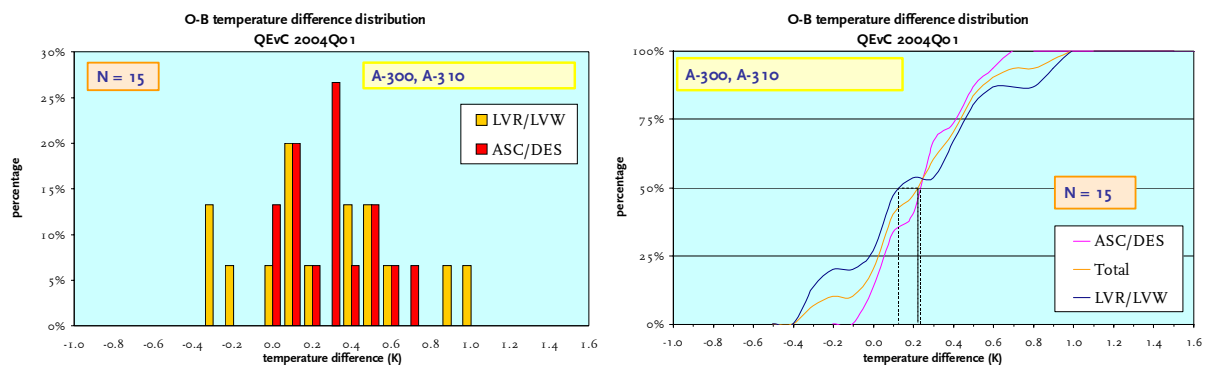
- Family A-300/A-310
- Family A-320 (A-318, A-319, A-320, A-321)
- Family A-330/ A-340

Boeing

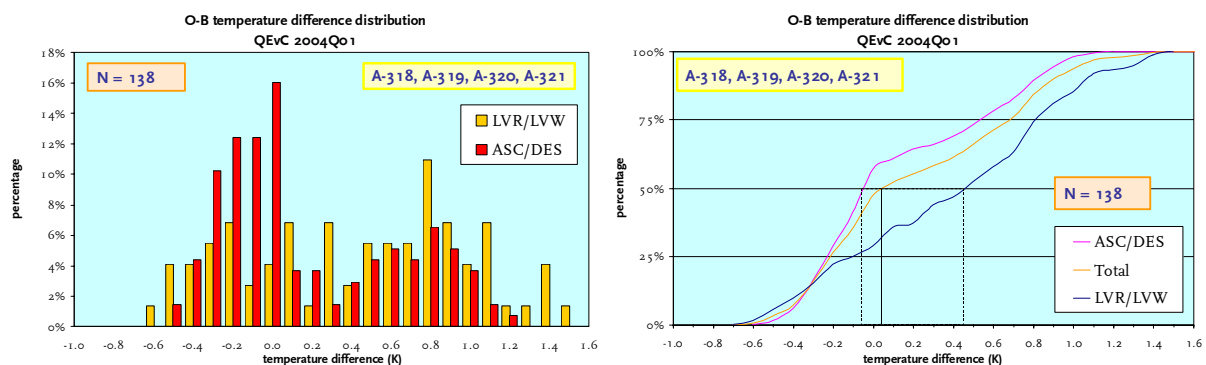
- Family B-737
- Family B-747
- Family B-757/B-767

For this selection the number (N) of aircraft was considered first. Statistics for other types of aircraft were not possible because the number of aircraft was too low for appropriate analyses.

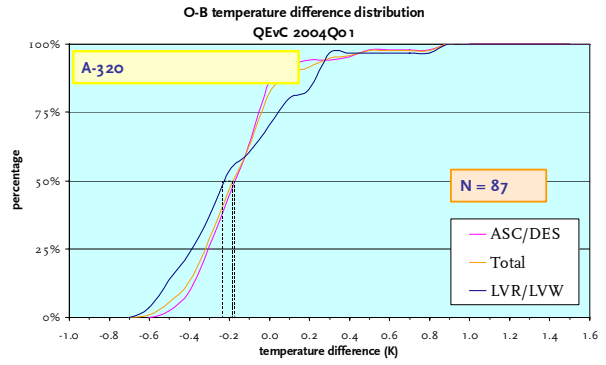
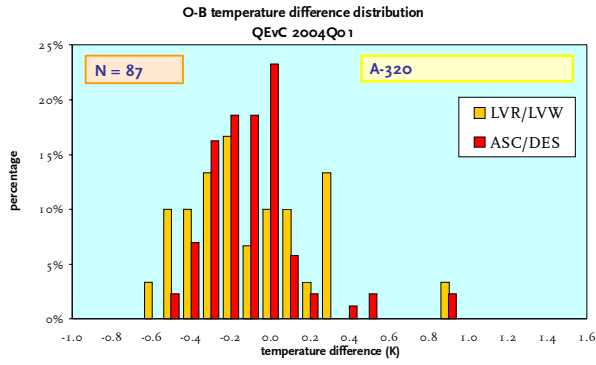
In fig. 21. these distributions are shown for these six sets of aircraft. In this figure both frequency and cumulative distributions. are presented. A cumulative distribution is useful because the steepness of the curve is a measure for the width of the distribution. Besides the median value at 50%, the temperature interval between 25% and 75% is representative for 50% of the set of selected aircraft. Because of a non-nominal behaviour of the A-320 family (see fig. 21. [b]), that set was investigated in more detail. It was found that a typical distinction had to be made between the set of A-318, A-319 and A-321 and the set of A-320 (see fig. 21. [c] and [d]). Note the remarkable difference between both sets. For all other sets the distributions were found to be as nominal. Especially the sets of Boeing aircraft are very comparable.



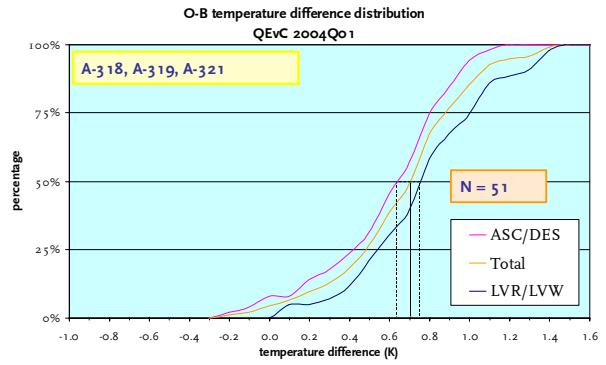
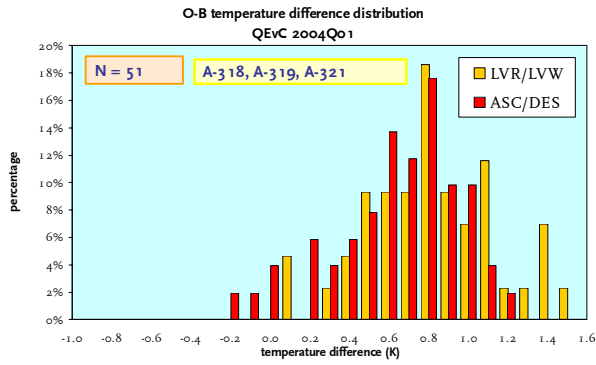
[a] Airbus family A-300/A-310



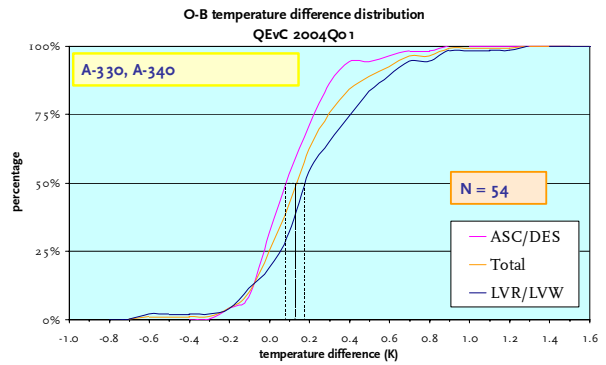
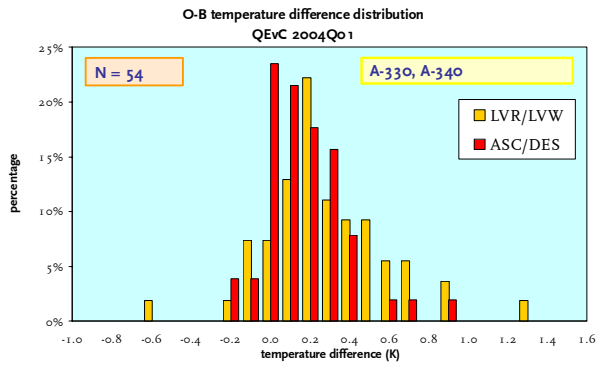
[b] Airbus family A-320



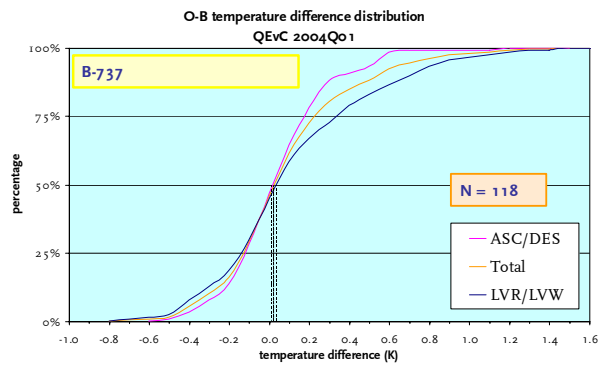
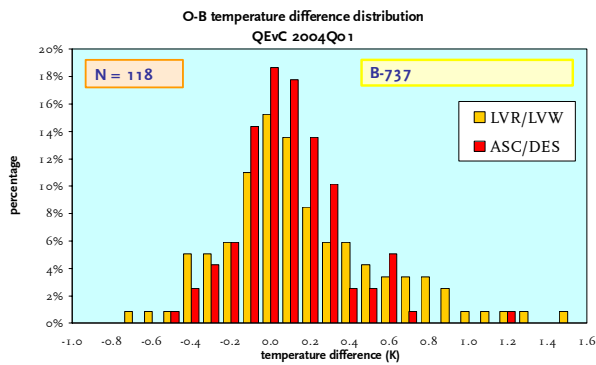
[c] Airbus A-320 only (family A-320)



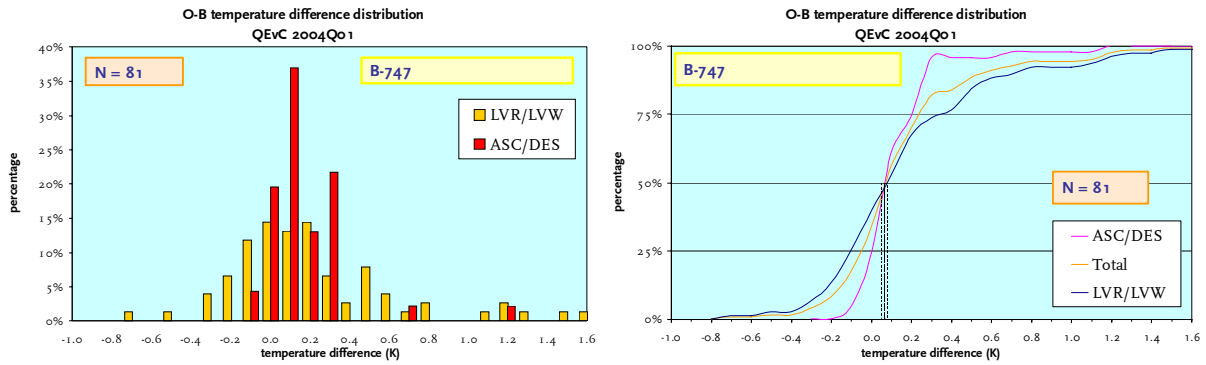
[d] Airbus A-318, A-319 and A-321 only (family A-320)



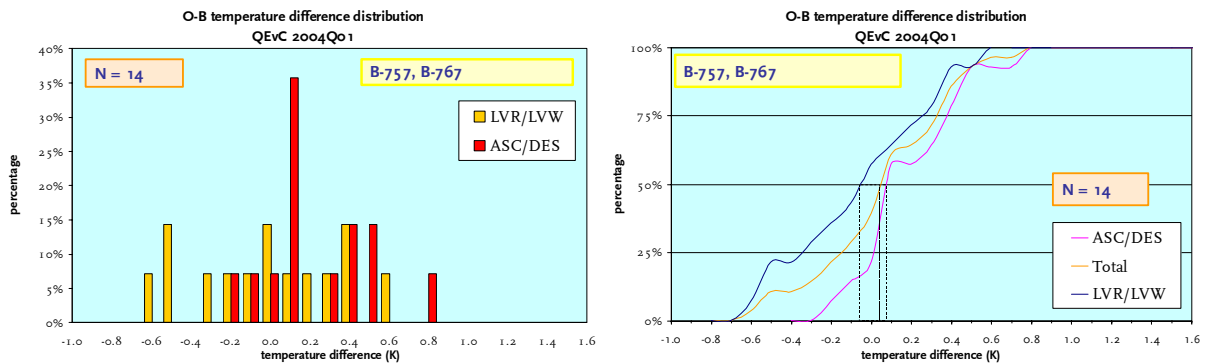
[e] Airbus family A-330/A-340



[f] Boeing family B-737



[g] Boeing family B-747



[h] Boeing families B-757/B-767

Fig. 21. Frequency and cumulative distributions for the various sets of aircraft.

From the above analysis the following table is derived:

Aircraft type	Median LVR/LVW /°C	Median ASC/DES /°C	Median all data /°C	width (50%) /°C
A-300, A-310	0.15	0.24	0.23	0.41
A-318, A-319, A-320, A-321	0.46	-0.04	0.06	0.90
A-320	-0.22	-0.17	-0.18	0.29
A-318, A-319, A-321	0.76	0.64	0.71	0.40
A-330, A-340	0.18	0.09	0.14	0.30
B-737	0.04	0.02	0.03	0.36
B-747	0.08	0.07	0.07	0.30
B-757, B-767	-0.05	0.08	0.05	0.48

In this table the three median values in °C are shown for each set of aircraft (all data, flight level only and ascending/descending only). For *all data* also the width containing 50% of all aircraft of that specific set.

To give an overall impression, these results are presented in fig. 22. for each set of aircraft. As expected most of the sets are comparable. However, a remarkable difference is observed for de set of A-320 aircraft and the set of A-318/A-319/A-321 aircraft, both belonging to the A-320 family.

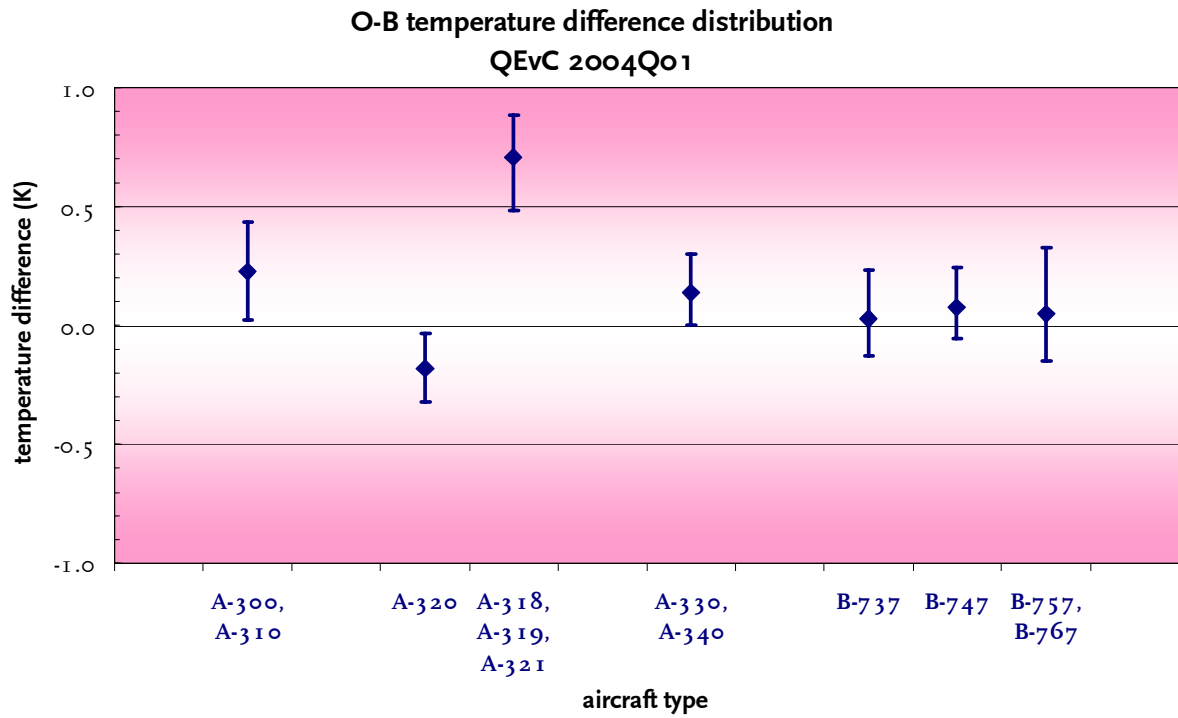


Fig. 22. Median values and 50%-widths (or boxes) for the different aircraft families. For four sets a rather nominal behaviour is found (all around 0.1 °C with a 50% box of about 0.4 °C). For the A-320 family remarkable biases from these sets were found.

