European Centre for Medium Range Weather Forecasts

ECMWF NEWSLETTER

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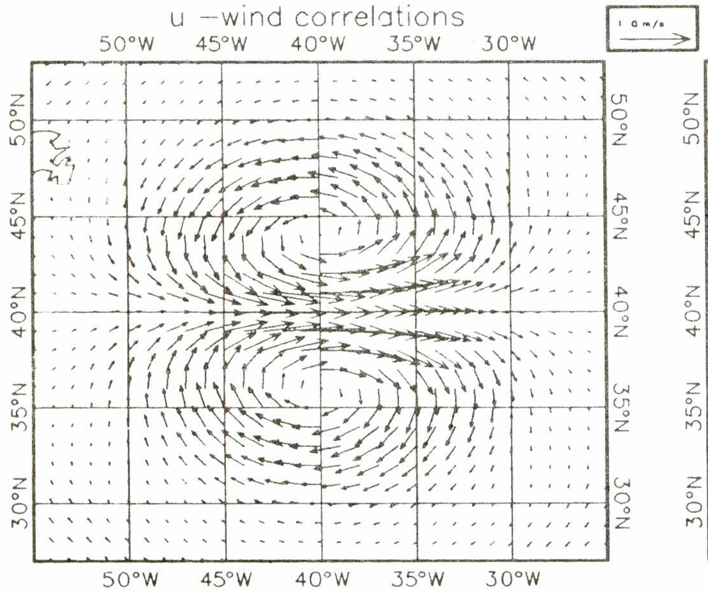

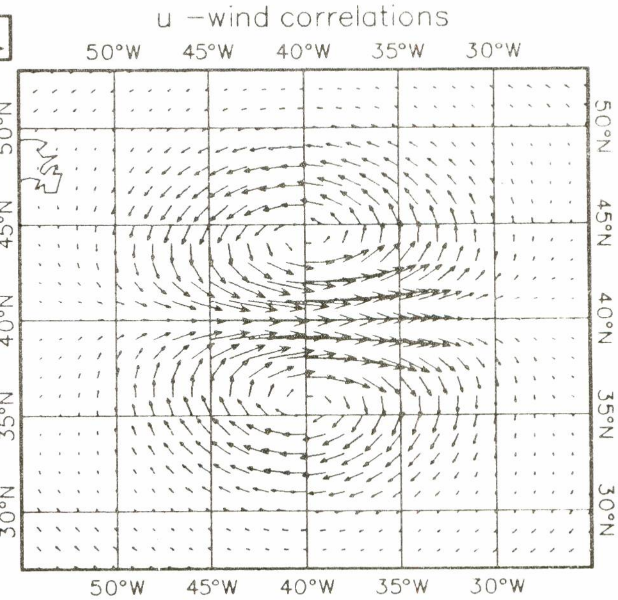

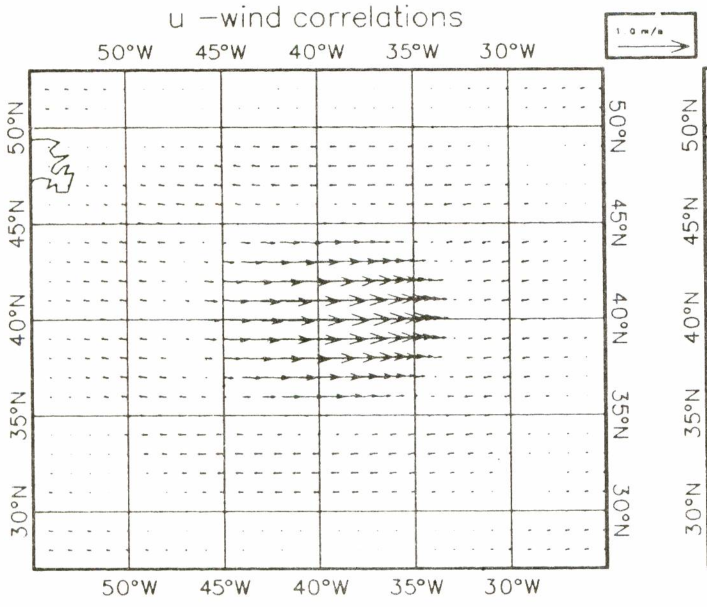

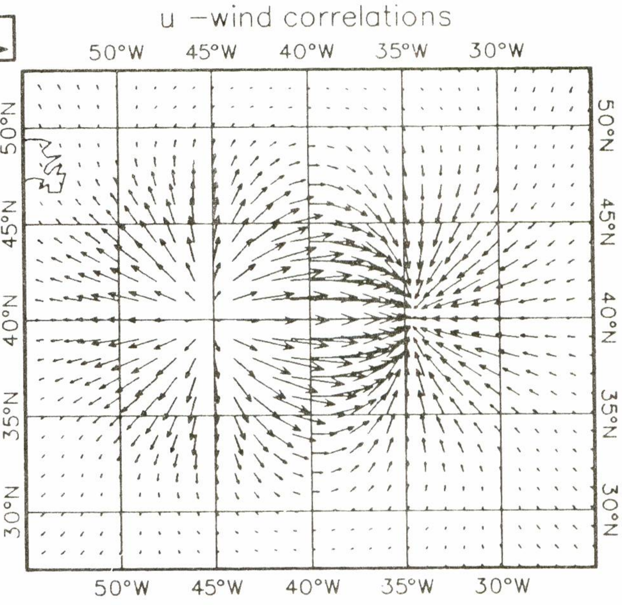

IN THIS ISSUE

COVER: The cover illustration depicts wind vector (u and v-components) correlations between points on the map and a u-component wind (westerly wind) at the centre of the map (40°N, 40°W). This is how the wind analysis increments would appear in the ECMWF analysis scheme if only one observation at 40°N, 40°W was present, showing stronger westerly wind than the first-guess forecast. The top left figure is for the non-divergent case, top right when 10% divergence is assumed for the wind error variance, lower left 50% divergence and the lower right is completely divergent. See article on page 2 for the full background.

This Newsletter is edited and produced by User Support.

The next issue will appear in September 1988.

The article on page 2 will be of interest primarily to those concerned with data analysis, as it discusses the background to the recent introduction of divergent structure functions into the ECMWF operational analysis.

ECMWF's main file storage facilities are gradually being transferred from the Cyber machines to a hierarchical filestore based on disks, cartridges and magnetic tapes attached to the IBM 3090 data handling machine. An article on page 14 describes the structure of the system and gives details of how it will be used from the Cray X-MP/48. The system is due to be introduced later this year.

CHANGES TO THE OPERATIONAL FORECASTING SYSTEM

Recent changes

An article describing the changes to the analysis introduced on 26 January is to be found on page 2.

Planned changes

(i) The most imminent change to the forecasting system involves a major revision to the analysis system, the implementation of which is planned for early summer 1988.

The changes involve the use of higher resolution structure functions and revisions to the quality control procedures applied to wind and satellite data.

In the present analysis system, the horizontal correlation of forecast error is modelled using a series expansion of 5 Bessel functions. A system has been set up with 8 Bessel functions in the expansion, the geostrophic assumption being progressively relaxed for the last 3 terms. This will lead to a higher resolution analysis in the horizontal. In individual areas the depth of intense storms and the associated level flow will be analysed more accurately, which leads to significant local improvements in the subsequent forecast.

(ii) A new suite of procedures for carrying out the analysis of surface variables will be implemented in two stages. Stage 1 will involve incorporating within the ECMWF analysis program the present procedures to interpolate snow and SST analysis to the model grid. In Stage 2, procedures to analyse the 2 m temperature and humidity will be incorporated.

(iii) It is expected that the adoption of a vertical finite element scheme and a new radiation scheme will take place in autumn 1988.

\- Bernard Strauss

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INTRODUCTION OF DIVERGENT STRUCTURE FUNCTIONS IN THE ECMWF ANALYSIS

Introduction

The ECMWF mass and wind analysis uses a multi-variate optimum interpolation (OI) scheme. Observed heights, pressures, wind components and thicknesses are used simultaneously to analyse surface pressure, heights and wind components on the model's Gaussian grid. The analysis uses a 6 hour first-guess forecast from the previous analysis and it is the differences between the observations and this first-guess which are analysed. The degree to which data are fitted is controlled by some of the statistical properties of the first-guess errors and observation errors. These are not known a priori but are modelled based on representative statistics accumulated at ECMWF.

The statistics are not only used to interpolate observed differences to gridpoints but they also have an important role in filtering the observations. Standard deviations of first-guess and observation errors determine the relative weights given to the first-guess versus the observations. The correlation functions (also referred to as structure functions) filter out observed differences which are not desired, e.g. random errors and motion on scales which are not resolved by the forecast model. Cross-correlations between heights and winds define the degree of geostrophy in the analysis.

At ECMWF the analysis is performed in "boxes" where all the observations in the box and its immediate surroundings are used to analyse the model variables at all the gridpoints in this volume. The sizes of the boxes are approximately 600 by 600 km in the horizontal (or less in very data dense areas). In the vertical the volume is divided into two slabs (surface - 100 hPa and 300 - 10 hPa). It is through this simultaneous use of observations that the filtering takes place and inside the box the analysis variables obey the relationships imposed by the statistical models (e.g. geostrophy). Neighbouring boxes, however, do not use exactly the same set of observations and there may be slight inconsistencies between the analyses in different boxes. Smoothing of the analysed departures from the first-guess is applied near the borders of the boxes but this does not guarantee that their spatial derivatives are also smooth.

The cross-correlations between u and v-components of the wind were, until recently, represented using a non-divergent statistical model of the wind forecast errors. This would make the resulting analysed departures from the first-guess forecast (analysis increments) non-divergent everywhere, if all the data from the whole globe were analysed simultaneously. Since this is not possible to achieve in practice, non-divergence could only be ensured locally inside one analysis box. The analysis increments still contained divergence on larger scales due to the different, albeit locally non-divergent, winds in the different boxes. However, on scales smaller than the box scale the divergence was largely spurious and "noisy" when, for example, calculated across a box boundary.

When the analysis increments are allowed to be divergent to some degree, by introducing a partly divergent model for the wind forecast errors, the analysis increments become coherent also on the box scales, as will be shown in a later section. It has for a long time been considered desirable to allow for divergence in the ECMWF analysis scheme. Examinations of FGGE analyses revealed deficiencies in the analysis of tropical wind data related to the non-divergent constraint. It had also frequently been observed operationally at ECMWF that in cases when tropical wind data indicated strong divergent flow the analysis hardly drew to the observed departures from the first-guess at all and an

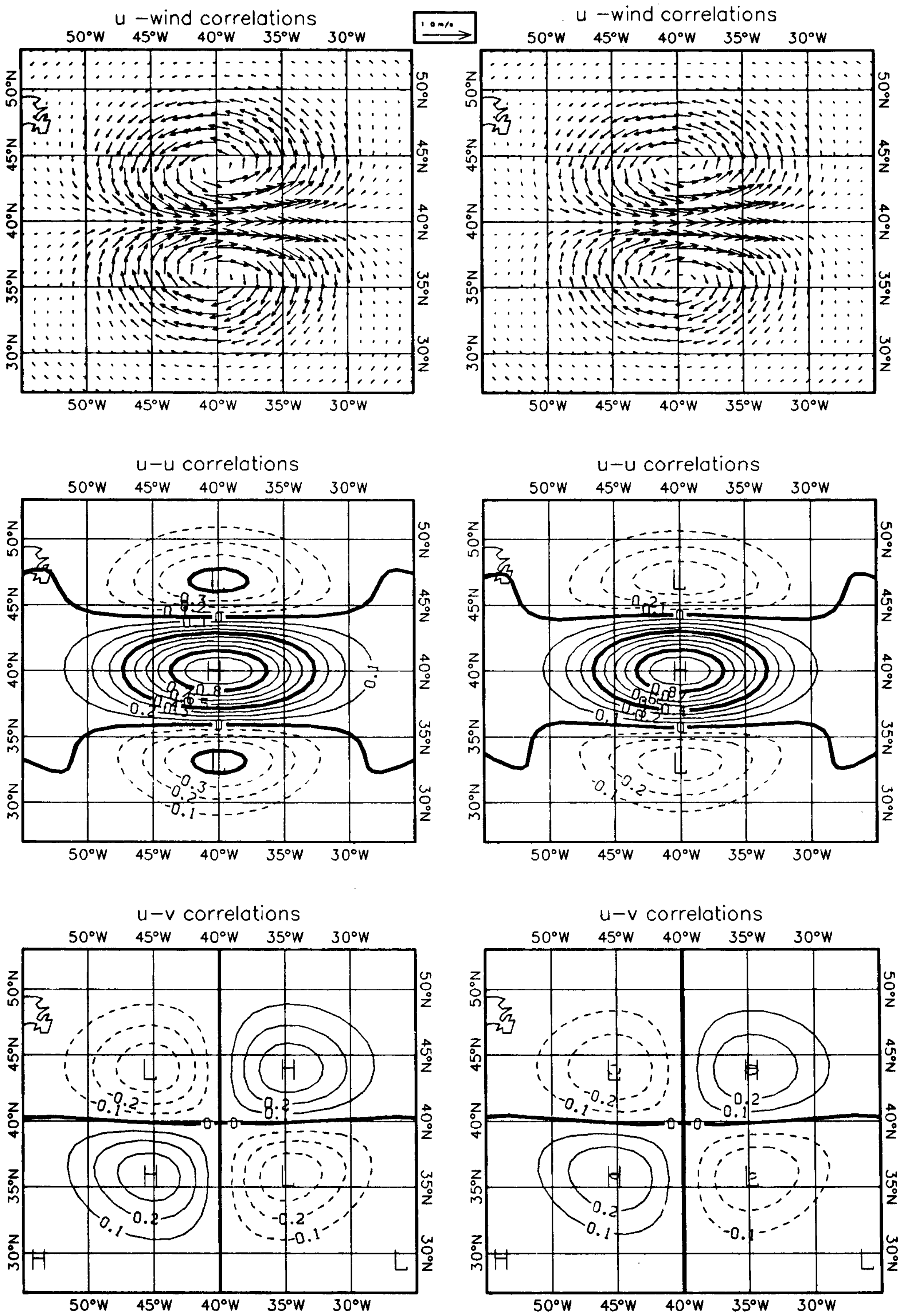


Figure 1. Horizontal correlations between a u wind component at 40N, 40W and wind vectors, u and v components for ν=0 (left) and ν=0.1 (right).

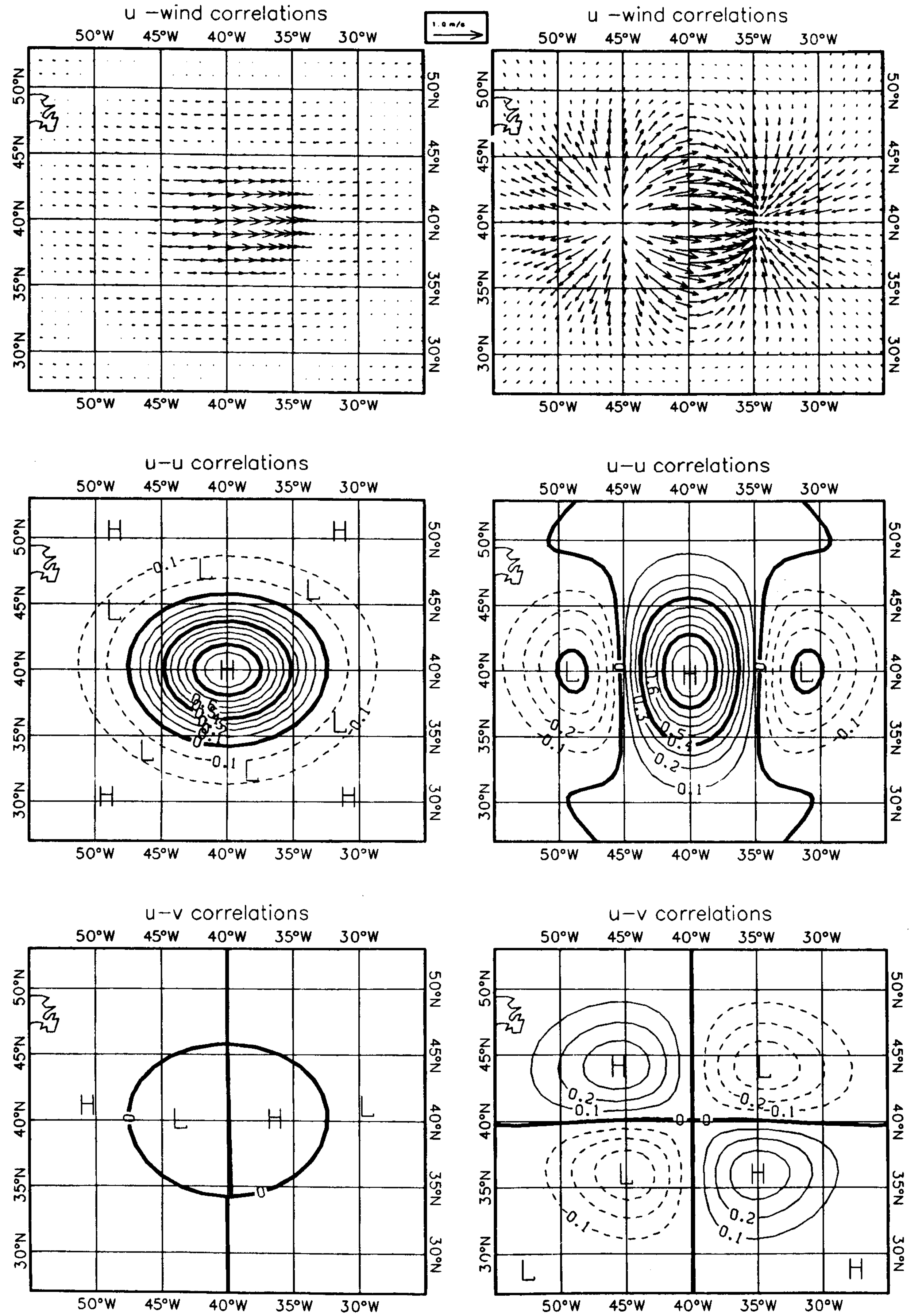


Figure 2. As Fig. 1 but for ν=0.5 (left) and ν=1.0 (right).

example of such a case is shown in a later section. We would like to at least analyse such data more faithfully by relaxing the constraint and this would also probably be a prerequisite for other assimilation and model developments in the tropics.

How the divergence has been included in the ECMWF analysis system

By introducing a wind forecast error model also for the velocity potential one can allow for a divergent component in the observed wind departures from the first-guess. The total wind forecast error variance is divided into a divergent part (υ) and non-divergent part ($1-\upsilon$). The horizontal wind correlations, which were previously derived using a statistical model only for the streamfunction errors, are now derived using both streamfunction and velocity potential models of the forecast error.

The effect on the wind correlations of introducing and increasing the divergent part of the wind forecast error can be seen in Figs. 1 and 2. They display the vector and scalar correlations with a single u-component situated at 40°N, 40°W. The correlations are derived using the ECMWF analysis code where spherical geometry is employed. The v-v correlations are not shown here; they can be found by rotating the u-u correlations 90 degrees anti-clockwise (apart from some change in shape due to map factors) and the v-u correlation is always the same as u-v. As υ is introduced with a value of 0.1 the major effect is to reduce the cross-correlation u-v and the negative lobes of the u-u correlation compared with the non-divergent correlations in Fig. 1 (left). The combined effect for the vectors is a significantly reduced return flow, as the top panels in Fig. 1 show. When $\upsilon=0.5$ the auto-correlation becomes circular (Fig. 2 left) and the cross-correlation zero. (This is of course only true when the same horizontal structures have been used for the streamfunction and velocity potential forecast error models). With this choice of υ the analysis is uni-variate in u and v and with the definition of υ this implies that equal amounts of vorticity and divergence are assumed for the first-guess error variance. Finally, when using purely divergent structure functions with $\upsilon=1$ (Fig. 2 right) it can be seen that the u-u and u-v correlations are of the same shape as for the non-divergent case but they are turned anti-clockwise 90 degrees.

The response in terms of analysis weights given to the divergent wind is very non-linear as υ is increased. A major part of the response takes place already as υ increases from zero to 0.1 and further increases have much smaller effects. Thus the exact choice of the divergent part of the forecast error is not crucial as long as it is not close to zero. The value of $\upsilon=0.1$ gives a ratio of 0.32 between the standard deviation of the divergent part of the wind and the total wind, which agrees reasonably well with the results of Hollingsworth and Lönnberg at ECMWF (based on radiosonde winds over North America). Also the effect on the analysed rotational wind is small with this choice, since the standard deviation of the rotational part of the wind error is only reduced by 5%.

The vertical correlation functions used for non-divergent winds and heights in the ECMWF analysis system are always positive and decrease asymptotically towards zero at large pressure separation. There is, however, evidence that there is a negative section in the vertical correlations of divergent wind. A vertical correlation function for divergence has been constructed so that it also has negative lobes before returning to zero. The horizontal correlations are assumed to have the same structure as for the non-divergent wind errors.

The impact of divergent structure functions on the analysis

This formulation for the divergent part of the correlations with $\upsilon=0.1$ was used to analyse a case at 861208, 00 UTC, when observations indicating strong upper level divergence over the western tropical Pacific were poorly analysed operationally at ECMWF. Fig. 3 shows an analysis with only non-divergent structure functions. The map reveals several areas where the analysis departs significantly from the observations. There is a marked southerly outflow at around 7°S extending from 160°E to 180°E. The SATOBs in this area between 160° and 170°E are not drawn to at all. The analysis is improved drastically when the divergent structure functions are included, as can be seen in Fig. 4. The analysed winds (short arrows) have turned from being easterly to north-easterly now and have increased in strength, all in much better agreement with the observations. Around the observations of the northerly outflow at around 7°N and between 170° and 180°E the effect has mainly been to change the direction of the analysed winds not only in the vicinity of the SATOBs but also some distance away, e.g. along the 180°E longitude all the way down to about 2°S. Here the combined effect of the aforementioned groups of observations seems to be to enhance an east-westerly divergent zone at about 2°S which was hardly present at all in the non-divergent analysis (Fig. 3).

A wind difference map (Fig. 5) over a slightly larger area highlights these features and shows a distinctive divergent signal with magnitudes of up to 10 m/s. At other levels the wind impact is reduced in both directions from the 200 hPa level displayed in Fig. 5. Especially in the boundary layer there are rather small differences; when noticeable at all, there are some minor areas with differences of around 1-2 m/s at 850 hPa connected, with the strong outflows at 200 hPa.

To further highlight the impact of using the divergent formulation, the analysis increments (analysis field - first-guess field) of divergence are shown in Fig. 6: first with the non-divergent correlations (Fig. 6a) and then with the divergent part included (Fig. 6b). It is evident from Fig. 6a that there is already a significant divergence in the non-divergent cast through different data selection in neighbouring boxes. This way of allowing for divergence is rather noisy, e.g. the large area of divergent increments between 140°E and 170°W is interrupted here and there by spots of no divergence. Such features disappear completely when allowing explicitly for divergence in the OI-equations as seen in Fig. 6b. The field has here a nice smooth appearance. Although many features also exist in Fig. 6a, they become continuous and have coherent large scale structures when the divergent structure functions are included. The vorticity field is virtually unchanged by the modification.

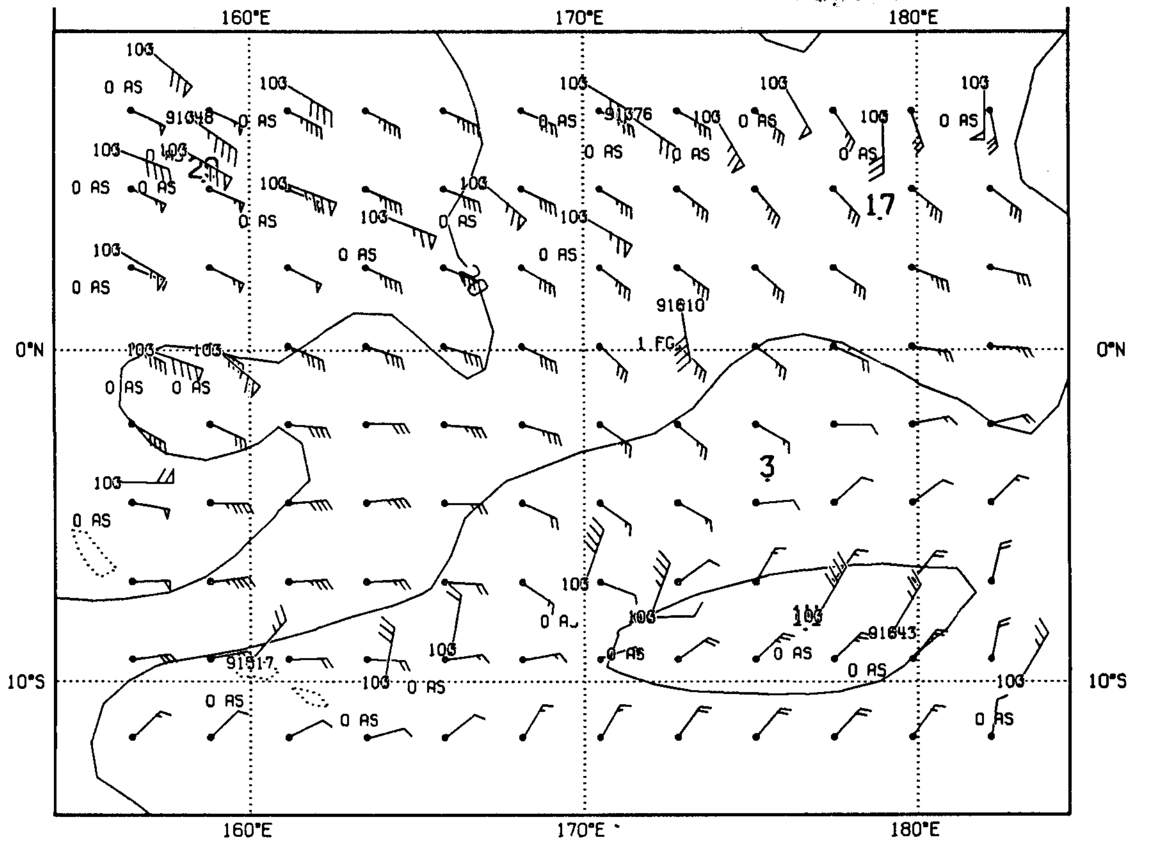


Figure 3. Wind observations and analysis with non-divergent structure functions at 200 hPa 861208 00 UTC. Short wind arrows represent the analysed wind and the isolines are for every 10 m/s.

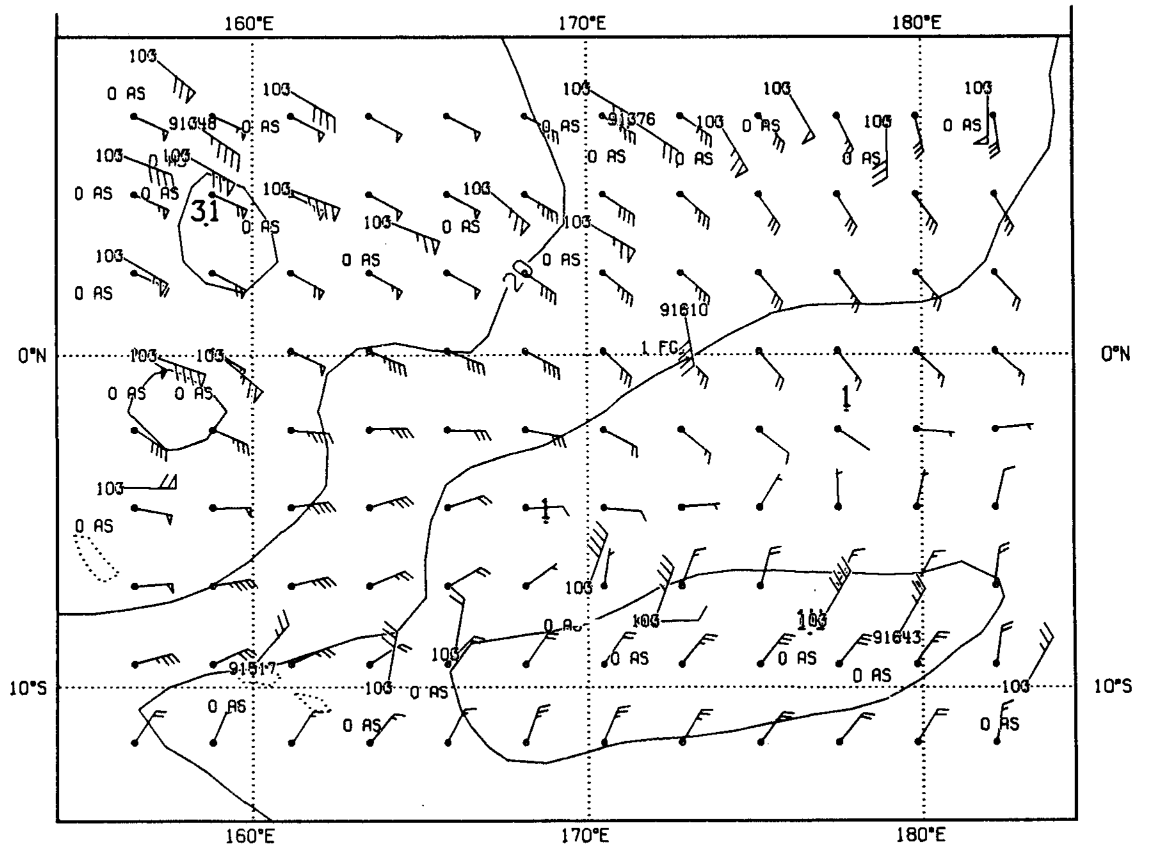
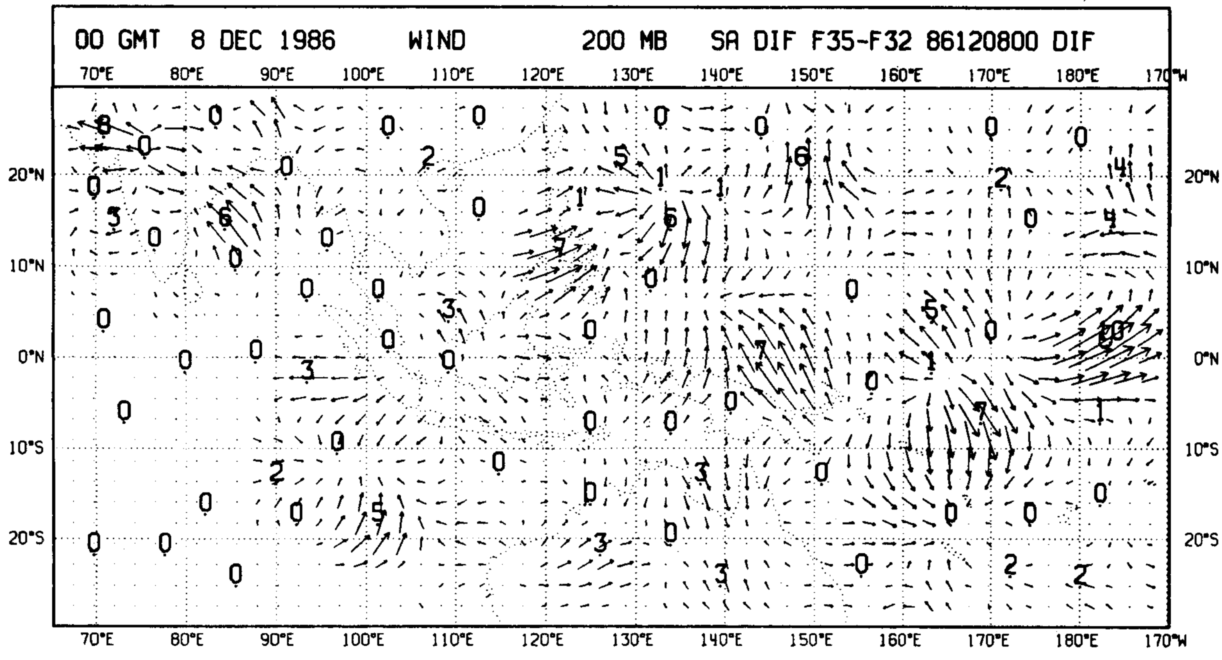


Figure 4. As Fig. 1 but for analysis with divergent structure functions.



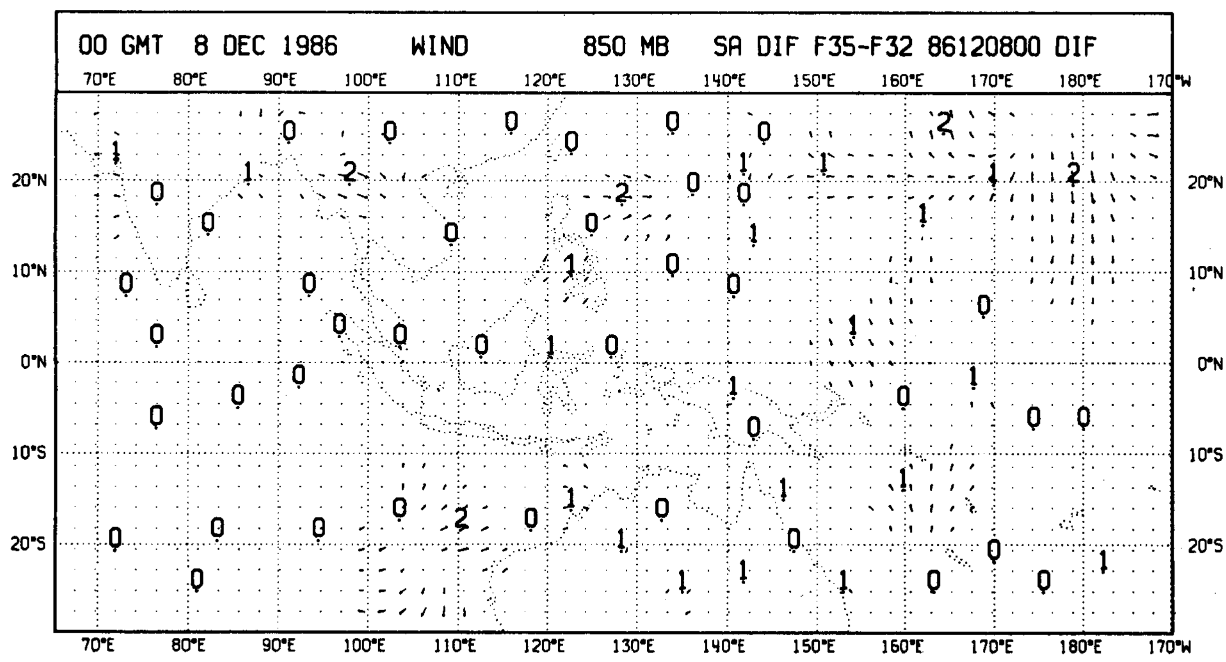


Figure 5. Wind differences 861208 00 UTC between analyses with and without the divergent structure functions at 200 hPa (top) and 850 (below). Isoline at 10 m/s and numbers indicate maxima (and minima) in m/s.

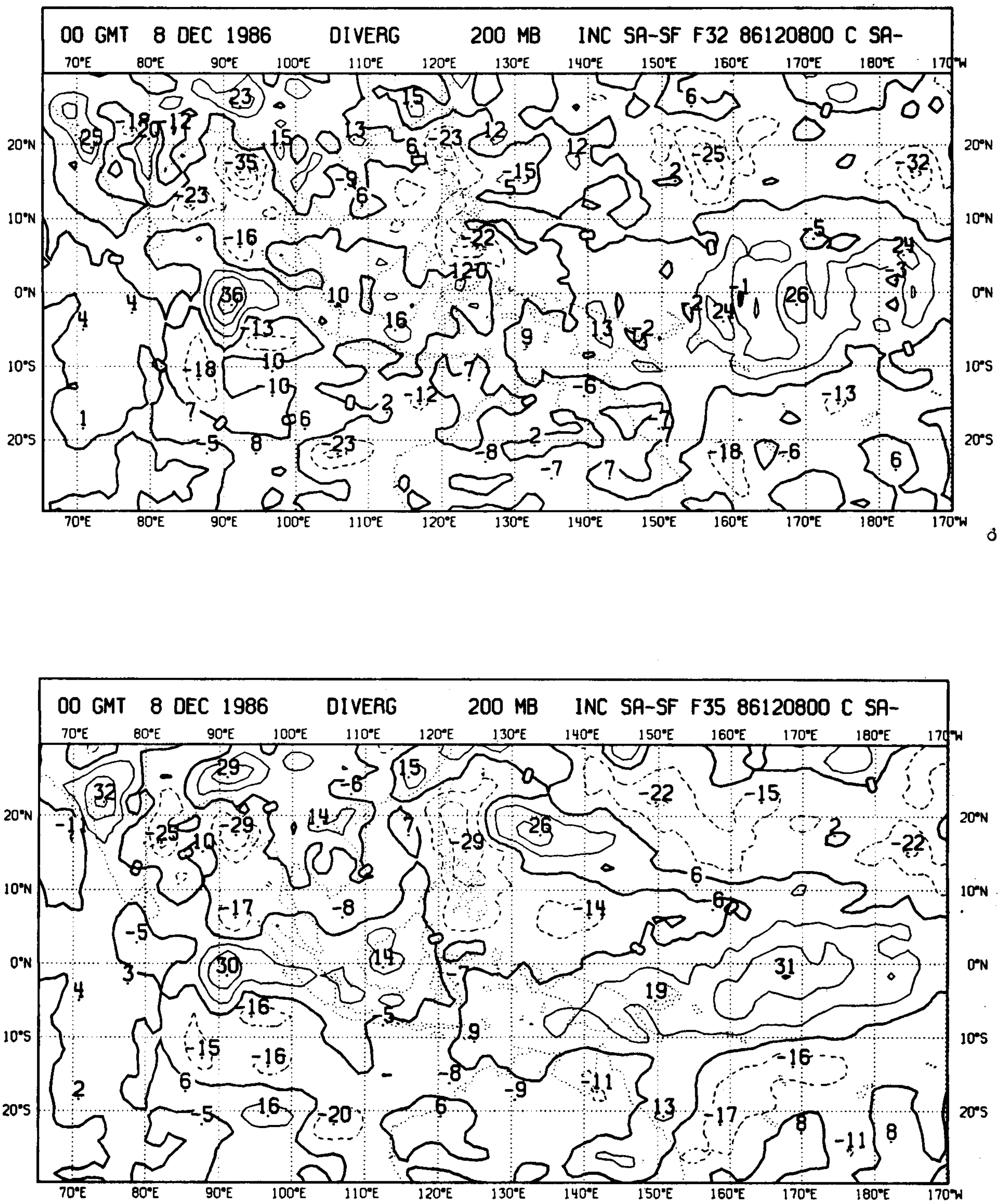


Figure 6. Analysis increments of divergence at 200 hPa 861208 00 UTC when analysing with the non-divergent structure functions (a,top) and the divergent ones (b,below). Unit is 10^{-6} s^{-1} and isolines are for every 10^{-5} s^{-1}.

Tests in data assimilations and forecasts

The period 861206, 00 UTC, to 861208, 12 UTC, was chosen for testing the divergent formulation in data assimilation. This period includes the situation investigated in the previous section. Also another period from 870822, 12 UTC, for five days until 870827, 12 UTC, was assimilated to test the impact of the divergent structure functions.

Wind differences between the tests and the operational analyses have been studied in detail, mainly in the tropics and subtropics where they were largest. The impacts did survive the initialisation to a large degree but were significantly damped during the ensuing 6 hour forecast. These differences were not possible to trace beyond the next analysis or in some cases beyond the next first-guess forecast. It seems that the impact of the divergent structure functions from an individual analysis is rather short-lived and that processes in the assimilating model or introduction of data in later analyses quickly damp the signal seen in one analysis.

The RMS-fits to wind data (TEMP, PILOT, SATOB and AIREP) were improved in these assimilations compared with the then operational fields assimilated with non-divergent structure functions. This is most pronounced for the fit to the analysis fields, although some improvement also remained after initialisation. The fits of the first-guess forecasts were not discernibly improved.

The divergent structure functions improve the analysis significantly but the forecast impacts are very small and rather neutral in terms of medium-range forecast scores. The analysis improvements were predominantly in the tropics and their impact was found to be short-lived during the assimilation, so the 10-day forecasts were not expected to be affected very much. Simply improving the divergent wind is not enough to alter forecasts of tropical convective systems radically but it is a prerequisite for further work in the area of tropical data assimilation. This formulation for the divergent structure functions was introduced operationally on 26 January 1988.

Per Undén

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ECMWF SUPPORTS THE FIGHT AGAINST DESERT LOCUSTS

Since the end of February 1988 ECMWF has daily sent a set of forecast charts up to 5 days to the Algerian Meteorological Service by telecopier. The forecasts are of surface temperature, 850 hPa and surface winds and precipitation.

This information is used in support of the fight against desert locusts, during the current very critical situation. The wind fields are used to forecast the likely movements of the locusts. Warnings are then issued and the means of treating the locust is decided, depending upon the weather conditions; aerial spraying is impossible if there are sandstorms triggered by strong winds in the North Sahara, so land treatments are used if strong winds are forecast. As the desert locust moves only when the temperature exceeds 17°C, the temperature fields are used to evaluate the time elapsed between the hour of minimum temperature and when the temperature is expected to be higher than 17°C. This allows the teams carrying out the treatment to assess the time available to perform their task. The forecasts of precipitation indicate the areas where the locusts can proliferate dangerously.

According to the Director of the Algerian Meteorological Service, the ECMWF forecasts have become a major aid in overcoming the locusts, and ECMWF is pleased to learn that the Algerian National Meteorological Office has recently been congratulated by the Algerian government for its effective contribution to this important fight.

- Bernard Strauss

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CORRIGENDUM

The T106 forecast shown in Fig. 1 of the article "A global forecast with T213 resolution" in the March 1988 issue was inadvertently presented over a smaller domain than the corresponding analysis and T213 forecast. The corrected figure is shown below. Note the improvement of T213 over T106 in the depiction of the cyclonic circulation south of Italy in these 3-day forecasts.

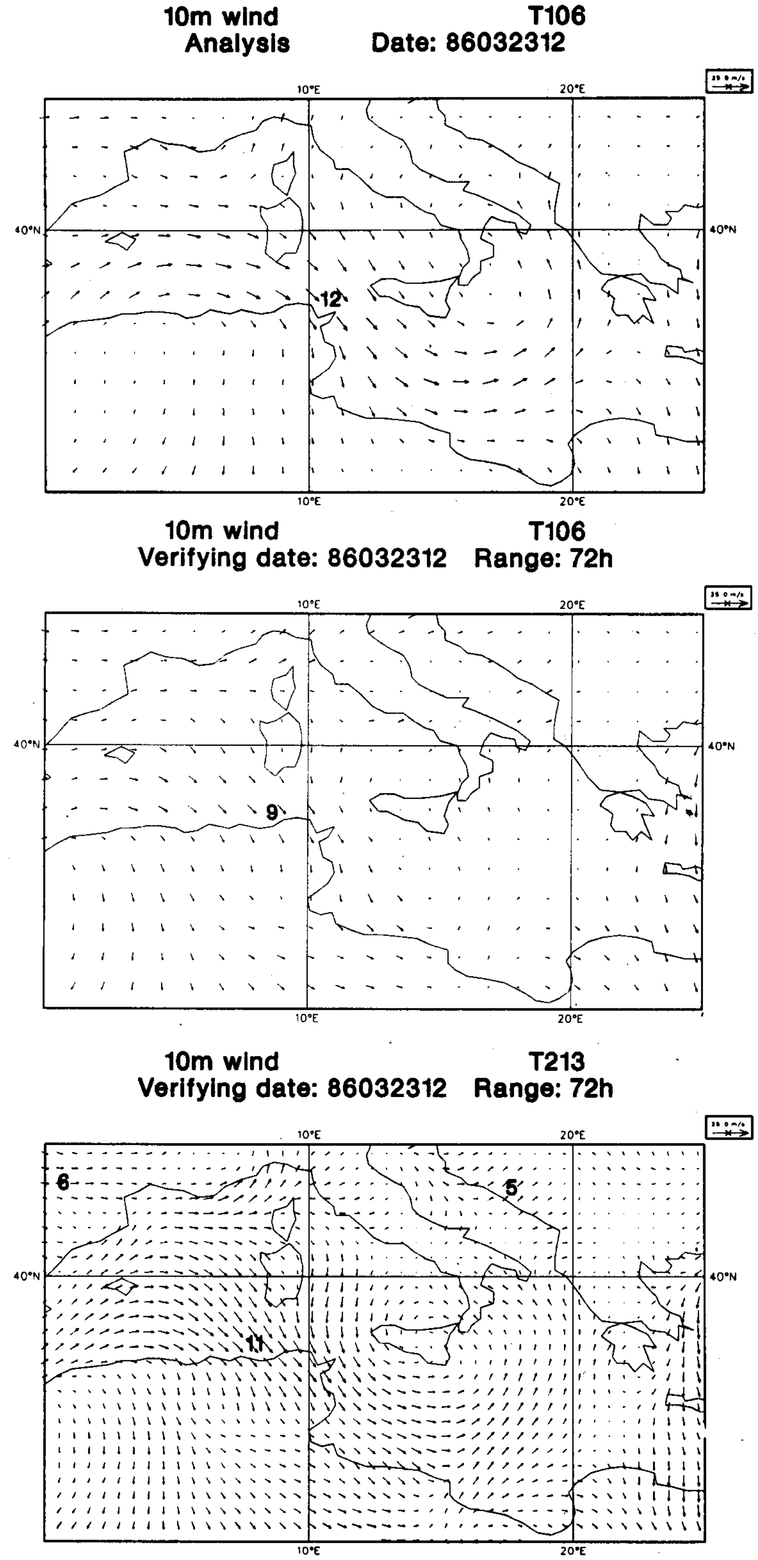

Fig. 1 Wind at 10m, with maxima marked in ms^{-1}, from the operational analysis for 12Z, 23 March 1986 (upper), and from 3-day T106 (middle) and T213 (lower) forecasts for this time.

ECFILE - THE ECMWF PERMANENT FILE SYSTEM

Later this year it is planned to introduce a full user file storage service available from the Cray. This means that jobs running on the Cray will be able to store and retrieve datasets in the ECMWF filestore on the IBM data handling machine. The following article describes this service.

Introduction

ECMWF's filestore on the data handling machine is being made available to users of the Centre's computers. The way in which users will be able to access this filestore will differ from system to system, but the basic underlying principles will be the same. There will be a utility which can be called from JCL (Job Control Language) and there will be a set of Fortan callable subroutines. The method of accessing the filestore from the CRAY is described below. Before describing the interface, it is necessary to give a brief description of the filestore itself.

The filestore

ECMWF's filestore is based on CFS, the Common File System developed at Los Alamos. It is a large centralised data storage/retrieval system residing on the IBM. Only complete files can be sent to and retrieved from the filestore.

The filestore resides on a hierarchy of storage devices on the IBM, consisting of 3380 disks, the 3850 mass storage facility and cartridge tapes. Files accessed frequently which are not excessively large will normally reside on disk. They can be migrated, by the system or by the owner, to mass storage or tape, where larger and less frequently accessed files would normally reside.

Directory structure

Files within the filestore reside in a hierarchical directory structure, e.g. User UID may have several files in the filestore such as:

```
                                    UID
|-----------------------------------|-----------------------------------|
VMS                                 COS                              NOS_VE
                                    |
   ---------------------------------|-------------------------------
   |               |                               |               |
proclib          modpl                           idat1           mylib
```

or he could have a more structured directory, e.g.

```
                                    UID
 |----------------------------------|-----------------------------------|
 VMS                                COS                              NOS_VE
               ---------------------|---------------------
               |      |         |              |         |
              PROC  craybin   crayjob        mylib    BENCHMARK
               |                                         |
         ------|------                 ------------------|-------
         |           |                 |                       |
      proclib    gpmprocs          SUPERLINK                  XMP
                                   ----|----                   |
                                   |       |          ---------|------
                                  Spl    data1        |     |        |
                                                     i/o  KERNEL  multi-job
                                                            |
                                                        ----|-----
                                                        |        |
                                                       Spl      data
```

Each registered user at ECMWF will have set up for him/her a root directory, under which there will be a set of 3 nodes called COS, NOS_VE and VMS. When a user saves a dataset using default keyword values, the dataset will be saved in the sub-tree under the node named after the operating system on which (s)he is running. Within that sub-tree users can create their own hierarchical storage structure.

Files in the filestore are owned by the owner of the root directory, UID in our example, and any resources used in storing these files are charged to the owner. Resources used in accessing and transmitting the file are charged to the user requesting the file. Files can only be accessed by the owner, unless (s)he specifically (or indirectly) gives other users permission to use them. The owner can give these permissions, called access rights, when (s)he creates the file, or prior to creating the file by permitting access to the parent node, or after creating the file by modifying the directory entry.

File formats

As stated earlier, complete files are stored to/retrieved from the filestore. Once the file is in the filestore it has no structure associated with it. It is simply a collection of bits, which is why data transfers to and from the filestore are done at the file level. However, the data in the file may be transformed before the file is stored in the filestore, if the user requests it, for example to convert from Cray Coded Blocked format to a 'universal format' which can be easily converted to the native coded file structure of other systems. For the Cray implementation it is planned to have 2 data formats for files within the filestore. The normal default format will be transparent (TR). This will be a straightforward bit copy of the Cray file Cray block; record control words, if any, will be saved in the file exactly as they appear in the Cray dataset. These files would normally only be processed on the Cray. A second format will be character blocked (CB), its exact format has yet to be determined, but it will be chosen such that utilities on the various computer systems, Cray, IBM, VAX, CDC, can easily translate the file into the native coded file structure. This will, for example, enable source programs to be created on one system, stored in the filestore, then read on any of the other systems.

Access rights

A user making a filestore request must have access rights to the file descriptor or directory node specified in the request. The owner of a tree automatically has all possible access rights to all nodes of the tree unless these rights have been explicitly removed. No other user can access nodes in a tree unless they are explicitly assigned access rights. It is recommended that users control access to their files in the filestore. All files should be protected against an unknown user having the ability to read the data. This protection can be provided by using a password, if universal access is given. Visiting scientists, consultants, experts and members of staff who are shortly to leave should assign Modify access to other members in their group. The various access rights are:

READ,WRITE,MODIFY,INSERT and BESTOW.

Access to the filestore from Cray jobs

General

A utility called ECFILE is available which allows jobs running on the Cray to access the filestore. The ECFILE control statement and subroutine have many possible parameters, not all of which are required and some of which are mutually exclusive. It has been designed so that the casual user of the filestore, who simply wants to store or retrieve a file, requires the fewest possible parameters, e.g. to save dataset MODPL in the filestore all user UID needs to code is:

```
ECFILE(FN=SAVE,DN=MODPL)
```

Similarly to fetch the dataset back to the Cray:

```
ECFILE(FN=GET,DN=MODPL)
```

This will save/retrieve the dataset, in TR format, as file UID/COS/MODPL within the filestore. The filestore pathname (filename) can be specified in several ways such that within job UIDABC the following all identify file UID/COS/MODPL

```
DN=MODPL.
DN=A,PDN=MODPL.
DN=A,PDN=MODPL,ID=UID.
DN=A,PATH=MODPL.
DN=A,PATH=/UID/COS/MODPL.
```

ECFILE control statement parameters

As with all other Cray control statements these consist of keywords or keyword-value pairs, the order of which is not relevant. The validity of a parameter depends on several things but the main factor is the filestore function being requested.

The main parameter is 'FN' ('Function'). This specifies which of the 10 implemented functions is being requested. These are:

SAVE, GET, DELETE, ADD, LIST, MODIFY, COPY, MERGE, MOVE, REMOVE

The main ECFILE functions

- FN=ADD - This function adds a new directory node to the user's directory. In this way it is possible to create a structured directory.
- FN=SAVE - This function saves a Cray dataset into the filestore, similar to the DISPOSE (...DC=ST...) command.
- FN=GET - This function retrieves a Cray dataset from the filestore, and has the option of first searching the Cray Permanent Dataset Catalog. It is similar to both the ACQUIRE and FETCH commands.

The file transfer mechanism

ECFILE is in reality two separate programs: a single-tasked Fortran program, which runs on the Cray whenever the ECFILE command is involved, and a multi-tasked PL/1 program, which runs continuously on the IBM. These two programs communicate with one another by means of the AAC (Application to Application Communication) routines of Superlink, which is the software developed by Cray to enable Cray jobs to access IBM datasets directly and to enable this type of inter-machine communication.

The processes executed for a GET function

Consider the command:

```
ECFILE(FN=GET,DN=MODPL)
```

This will result in the following steps being taken:

(i) CSP will load ECFILE;

(ii) ECFILE first calculates the "missing" ID, 'UID' in our example, and then attempts to ACCESS that dataset. If the ACCESS is successful, then ECFILE terminates. If not:

(iii) ECFILE constructs the filestore command:

```
GET MODPL:/UID/COS/MODPL
```

and connects to a task running in its partner program on the IBM;

(iv) having successfully connected, it passes this command to its partner, which then passes the data in the relevant filestore file over to ECFILE, which writes these data to disk file MODPL;

(v) once all the data are written, the file is catalogued and ECFILE terminates.

Limitations and enhancements

Limitations

Initially the main limitations will be that:

- the 'universal format' will not be available. 'DF=CB' will be treated as 'DF=TR';
- Cray datasets over 12,404,340 words (99,234,720 bytes) cannot be handled;
- maximum depth of directory structure is 48 levels;
- only 1 edition/cycle of a dataset can exist within the filestore.

Enhancements

The following enhancements are possible:

- automatic data format recognition, i.e. ECFILE will recognise whether a dataset is in 'TR' or 'CB' format and automatically convert it, if necessary;
- an UNDELETE function to rescind the action of a DELETE, if executed early enough;
- the concept of a CURRENT, PREVIOUS, NEXT version of a dataset;
- automatic handling of datasets greater than 100 Mbytes.

- Neil Storer

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STILL VALID NEWS SHEETS

Below is a list of News Sheets that still contain some valid information which has not been incorporated into the Bulletin set or republished in this Newsletter series (up to News Sheet 216). All other News Sheets are redundant and can be thrown away.

No.	Still Valid Article
16	Checkpointing and program termination
67	Attention Cyber BUFFER IN users
73	Minimum Cyber field length
89	Minimum field length for Cray jobs
93	Stranger tapes
120	Non-permanent ACQUIRE to the Cray
121	Cyber job class structure
127	(25.1.82) IMSL Library
135	Local print file size limitations
136	Care of terminals in offices
140	PURGE policy change
152	Job information card
158	Change of behaviour of EDIT features SAVE, SAVEX.
	Reduction in maximum print size for AB and AC
164	CFT New Calling Sequence on the Cray X-MP
172	Change to CFT Compiler default parameter (ON=A)
176	Archival of Cyber permanent files onto IBM mass storage
178	TIDs on Cray include 2 chara. TID plus 3 chara. source computer ID.
	Caution with ACQUIRE on RERUN jobs
183	NEXT version of Cray ECLIB and CONVERT
186	PROCLIB changes
187	CFT 1.14. Bugfix 4
	Maximum memory size for Cray jobs
189	ROUTEDF
190	Using ROUTE to direct RJE output to the Centre
194	NOS/BE level 664
	Preventive maintenance schedules
197	MARSINT - subroutines for transformation from spectral to Gaussian or regular lat.-long. grid, and Gaussian to/from regular lat.-long. grid
	PROCLIB changes
198	Using the MOHAWK printer
201	New Cray job classes
203	Magnetic tape problems and hints on avoiding them
204	VAX disk space control
205(8/7)	Mispositioned cursor under NOS/VE full screen editor
206	MARSINT software changes
207	FORMAL changes under NOS/VE
	Job submission from within a Cray job, using LAUNCH
208	Restriction of Cray JCL statement length
210	ECMWF data archives
212	MFICHE command from NOS/VE
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A NEW TELEPHONE SYSTEM FOR ECMWF

Introduction

The Centre's present Private Automatic Branch Exchange (PABX) telephone system is based on traditional electromechanical relay technology. The system now installed at ECMWF has not been manufactured for a number of years and for some time it has been increasingly difficult to obtain spare parts, with the result that the service quality has deteriorated unacceptably. In addition, the introduction of new services by the PTTs, in particular ISDN (Integrated Services Digital Network), meant that the time was right to purchase a replacement.

Following the Centre's normal open tendering procedure during the autumn of 1987, the Director decided, on 8 December 1987, to award the contract to Plessey Communications Limited, whose offer was found to best meet ECMWF's requirements.

Telephony Facilities

The new system is due to enter service on 20 June 1988. A new call logging and call management facility, in addition to more sophisticated PABX facilities, will allow Centre staff to dial outgoing calls directly. Initially, however, the Centre will keep its present external telephone number (+44 734 876000) and external incoming calls will be answered by the telephone operator. Towards the end of the summer (currently planned for September), the Centre will install a new ISDN service to British Telecom based on a 2.048 million bits per seconds link, which will provide 30 digital circuits operating at 64 thousand bits per second (Kbps). This service will allow direct dial in facilities, so that external incoming calls can be directed immediately to the required extension, removing the need for them to be answered by the operator. At that time the Centre's telephone numbers will change.

Data Traffic

More important than the telephony facilities in the longer term is the ability to use the PABX to pass 64 kbps data over the public ISDN. As the public ISDN becomes available and interconnected throughout the Member States, it is likely that the Centre's existing private medium speed circuits will be gradually replaced by circuit switched data calls over ISDN.

Initially, it is intended to use the data facilities of the PABX only for internal calls but external experiments will begin as soon as the ISDN service is available.

Wiring

Since the original PABX was installed, the telephony supply and service industry in the United Kingdom has been liberalised, with the effect that new standards for internal telephone wiring apply and the telephone wiring at ECMWF has had to be replaced. At the same time, the opportunity is being taken to install thin wire Ethernet cabling throughout the Centre. Also a new internal radiopaging system is being installed to allow essential staff to be easily located.

At the time of writing, the installation work is well advanced and everything points to a successful implementation into service on 20 June.

- Peter Gray

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ECMWF CALENDAR 1988

5 - 9 September	Seminar: Recent developments in analysis and data assimilation
12 - 14 September	16th session of the Scientific Advisory Committee
14 - 16 September	13th session of the Technical Advisory Committee
27 - 29 September	41st session of the Finance Committee
24 - 26 October	Workshop on surface processes
23 - 24 November	29th session of the Council
5 - 9 December	Workshop on use of parallel processors in meteorology

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ECMWF PUBLICATIONS

TECHNICAL MEMORANDUM NO. 141:	An experimental scheme to predict forecast skill
TECHNICAL MEMORANDUM NO. 142:	The verification of objective analyses: Diagnostics of analysis system performance December 1987
TECHNICAL MEMORANDUM NO. 143:	Use of satellite vertical sounder data in the ECMWF analysis system
TECHNICAL MEMORANDUM NO. 144:	Prediction of monsoon rainfall over India by the ECMWF model
SEMINAR PROCEEDINGS:	The nature and prediction of extra-tropical weather systems, 7-11 September 1987, 2 vols.
WORKSHOP REPORT:	Radiosonde data quality and monitoring (ECMWF/WMO), 14-16 December 1987

User Guide to ECMWF Products

BINARY UNIVERSAL FORM FOR DATA REPRESENTATION - FM 94 BUFR. Collected papers and specification

FORECAST REPORT NO. 38:	Mar - May 1987
FORECAST REPORT NO. 39:	Jun - Aug 1987
FORECAST REPORT NO. 40:	Sep - Nov 1987
FORECAST REPORT NO. 41:	Dec 1987 - Feb 1988

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WORKSHOP ON PARAMETRISATION OF FLUXES OVER LAND SURFACES

24 - 26 October 1988

The workshop will be organised by the Research Department following the usual format of 1½ days of formal presentations followed by 1½ days of discussion, during which time a document reflecting the state of the art and possible recommendations will be produced by the participants.

The workshop is primarily aimed at discussing parametrisation schemes used for land surface processes in forecast models and their possible improvement and validation against appropriate data sets. The problems examined will be:

a) Parametrisation of fluxes over land surfaces

This will cover the observational basis and design of parametrisation schemes for a variety of surface conditions including bare land, vegetated and snow covered areas. The use of results from HAPEX-MOBILHY and the availability of global data sets to define relevant parameters will be discussed. Problems related to sub-grid-scale orographic effects will not be covered in this workshop.

b) Implementation and impact of schemes within forecast models

This will include discussion of the problems associated with the analysis of surface variables and the evaluation of the impact of surface schemes on forecasts of weather elements and on simulations of the atmospheric circulation.

c) Validation techniques

Three validation approaches will be discussed:

(i) the use of field experiments such as HAPEX-MOBILHY and FIFE for local verification;

(ii) the use of adequate global data sets derived from in situ measurements and remote-sensing;

(iii) comparisons between models.

Gilles Sommeria-Klein

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INDEX OF STILL VALID NEWSLETTER ARTICLES

This is an index of the major articles published in the ECMWF Newsletter plus those in the original ECMWF Technical Newsletter series. As one goes back in time, some points in these articles may have been superseded. When in doubt, contact the author or User Support.

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- surface and sub-surface scheme revised	38	June 87	3
- T106 high resolution version	31	Sept.85	3
- vertical resolution increased from 16 to 19 levels	34	June 86	9
Systematic errors - investigation of, by relaxation experiments	31	Sept.85	9

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* T indicates the original Technical Newsletter series

USEFUL NAMES AND 'PHONE NUMBERS WITHIN ECMWF

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	-	Telefax (No. 869450)		
	-	COMFILE (See Bulletin B1.5/1)		
REGISTRATION				
Project Identifiers	-	Pam Prior	OB 016	355
Intercom & Section Identifiers	-	Tape Librarian	CB Hall	332
COMPUTER OPERATIONS				
Console	-	Shift Leaders	CB Hall	334
Reception Counter) Tape Requests)	-	Tape Librarian	CB Hall	332
Terminal Queries	-	Norman Wiggins	CB 028	454
Operations Section Head	-	Bruno Baumers	CB 023	351
Telecoms Fault Reporting	-	Michael O'Brien	CB 035	209
DOCUMENTATION	-	Pam Prior	OB 016	355
Distribution	-	Els Kooij-Connally	OB 316	422
LIBRARIES (ECLIB, NAG, CERN, etc.)	-	John Greenaway	OB 017	354
METEOROLOGICAL DIVISION				
Division Head	-	Horst Böttger	OB 008	343
Applications Section Head	-	Rex Gibson	OB 101	369
Operations Section Head	-	Bernard Strauss	OB 004	347
Meteorological Analysts	-	Taskin Tuna	OB 005	346
	-	Alan Radford	OB 006	345
	-	Alex Rubli	OB 003	348
Meteorological Operations Room	-		CB Hall	328/443
COMPUTER DIVISION				
Division Head	-	Geerd Hoffmann	OB 009A	340/342
Operating Systems Section Head	-	Claus Hilberg	CB 133	323
User Support Section Head	-	Andrew Lea	OB 018	353
Communications & Graphics Section Head	-	Peter Gray	OB 227	448
GRAPHICS PROJECT				
Project Leader	-	Jens Daabeck	OB 013	358
RESEARCH DEPARTMENT				
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