Centre Sismologique Euro-Méditerranéen
European-Mediterranean Seismological Centre

Newsletter

N° 12 FEBRUARY 1998

EDITORIAL

Happy New Year to all our members, data providers and other readers. At the start of 1998, I would like, first, to wish a warm farewell to Bruno Feignier, our Secretary General for the past 4 years, who invigorated and developed EMSC through its co-ordination centre at Bruyères-le-Châtel. I thank him both personally and on behalf of all of us for his magnificent commitment and vision throughout such an important period. As reported at our Assembly in Thessaloniki, he hands the baton over to Florence Rivière who brings to our table a broad, relevant experience most recently enhanced through her scientific work and national representations in the context of the Nuclear Test Ban Treaty and related Working Groups. Welcome aboard, Florence, to the most difficult job in the European-Mediterranean area and good luck in your dealings with the 39 members in 25 countries which we now are (see back page for details). I extend that welcome to a new member of her team at Bruyères, Emmanuel Papillon, who joins Régis Le Dren. Emmanuel is focusing on the development and testing of the new EMSC Eurobull software while Régis continues his responsibility for data management and the alert software.

This issue of the newsletter includes a presentation of the EMSC Web page by Régis Le Dren, a report on the upgrading and extension of the long-standing, IPG GEOSCOPE network by Jean-Paul Montagner and Geneviève Roult, and a proposed new parameter file format for data exchange which has been developed by Jens Havskov for the ISC Executive Council. European and Worldwide data exchange and data access has advanced rapidly in recent times reflecting the spread of high capacity digital techniques for acquisition, processing, communication and automation; and it continues. Our own European Community-sponsored project "A Rapid Warning System for Earthquakes in the European-Mediterranean Region," being conducted with 7 members, is extending the network from which EMSC receives information automatically on a time scale (minutes) which we can use in rapid determinations. Stations in the north-west (Netherlands and Scotland), south-west (Canaries) and the east (Romania and Greece) are all coming on-line. The project will be completed by the time of our next General Assembly at the ESC in Tel Aviv, 23-28 August 1998. A full report will be given and ideas will be solicited from all members on the prospect of even wider, rapid access to digital data.

Chris Browitt
President

Figure 1 : EMSC Home Page

THE EMSC ON THE WEB

Régis Le Dren, EMSC

Introduction

Following up with the new technology, the EMSC is now accessible on the World Wide Web.
In order to make its data and its results available to its members and to the scientific community at large, a Web site has been developed at the EMSC.
What is currently found on this Web site and what will be in the future is described thereafter.

The current EMSC Web site

The site is accessible at :

http://www-csem.bruyeres.cea.fr

This will take you to the home page. This page is divided in two parts: a menu on the left, and a Welcome Page on the right, as shown on Figure 1 on the cover page of this Newsletter.

The first menu item on the left menu summarizes the **History** of the EMSC. Important mile-stones and main objectives of the EMSC may be found there.

The list of the **Members** as defined during the last General Assembly is available under the second menu item of the menu. The members are divided into three categories :
- Key Nodal Members
- Active Members
- Members by Right

Most of the members have developed their own Web site, and a link has been set up from the EMSC Web site to these sites.

The **Activities** menu item presents an up-to-date map of the events that triggered the EMSC alert system as presented in Figure 2. Two different types of alerts are displayed on this map: red diamonds represent the alerts related to the Rapid Determination of Epicenter project, and green diamonds represent the others alerts.

Under the **Latest News** menu item three topics are presented: information about recent events and

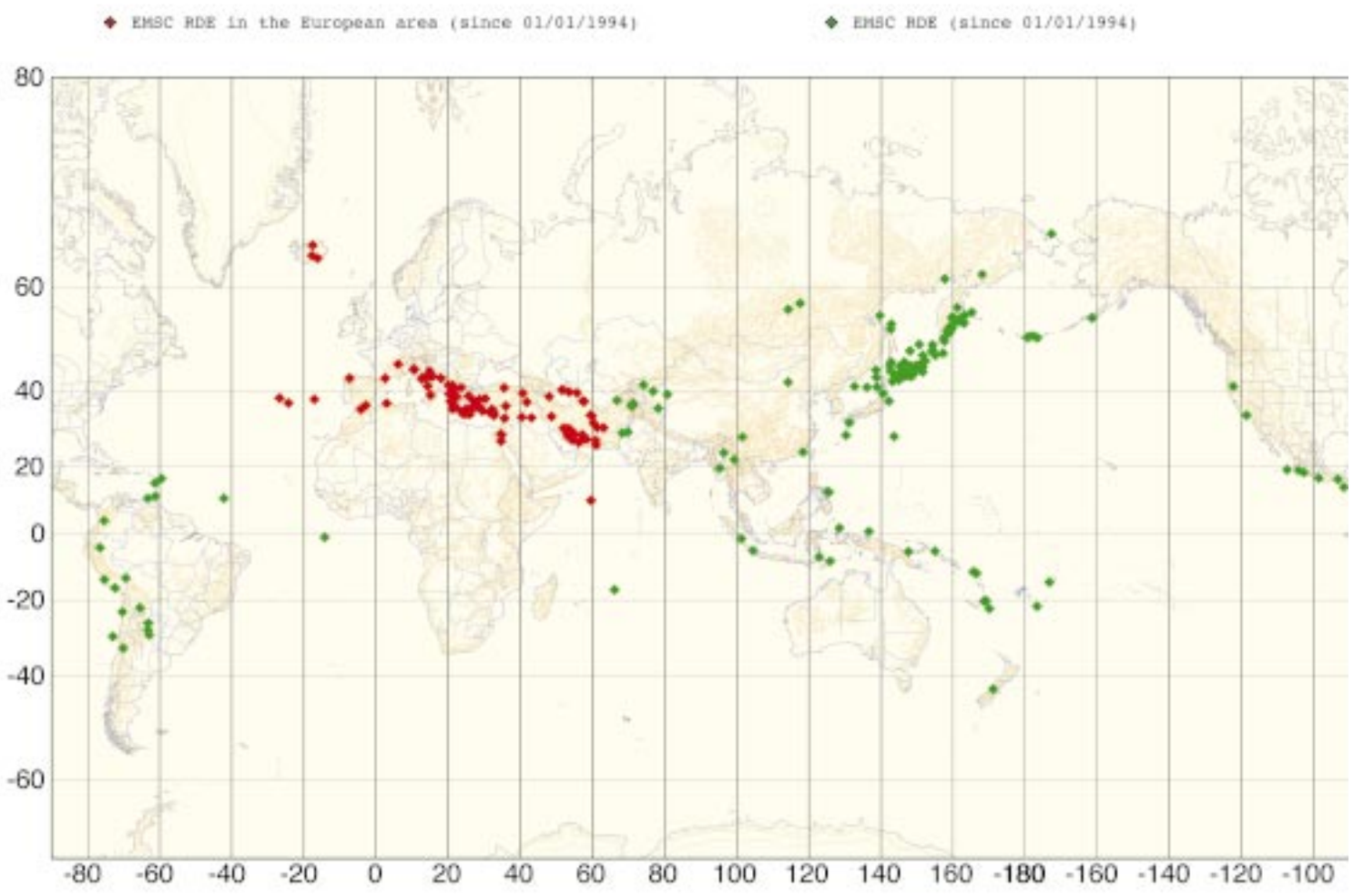

Figure 2 : EMSC Rapid Determination of Epicenters (given at 01/14/1998)

the EMSC Data Request Manager (DRM).

• the **Last Dissemination** menu item provides the location and the related arrival times of the last event that triggered the alert system are shown here.

• the next menu item provides the **Last Double Couple Solution** given by GFZ-Potsdam. This computation is performed for events located in the Euro-Mediterranean area only.

• the third menu item is a **View to the DRM** which includes the near real-time seismicity catalogue is presented. Only the hundred most recent messages are shown. These messages are sent to the EMSC by tens of institutes around the world. These messages include arrival times and for some of them, event locations. The EMSC uses these messages to trigger the alert system. To access information from older messages the Web link EMSCDRM is a connection to the Data Request Manager (DRM) (Figure 3).

Data may also be retrieved through the DRM and e-mailed to a given address. Other information may be accessed such as the catalogue of the alerts or the co-ordinates of the stations contributing data to the EMSC.

The last menu item presents the EMSC **Organization**, from the staff to its various committees. Phone numbers to contact the EMSC staff may be found here.

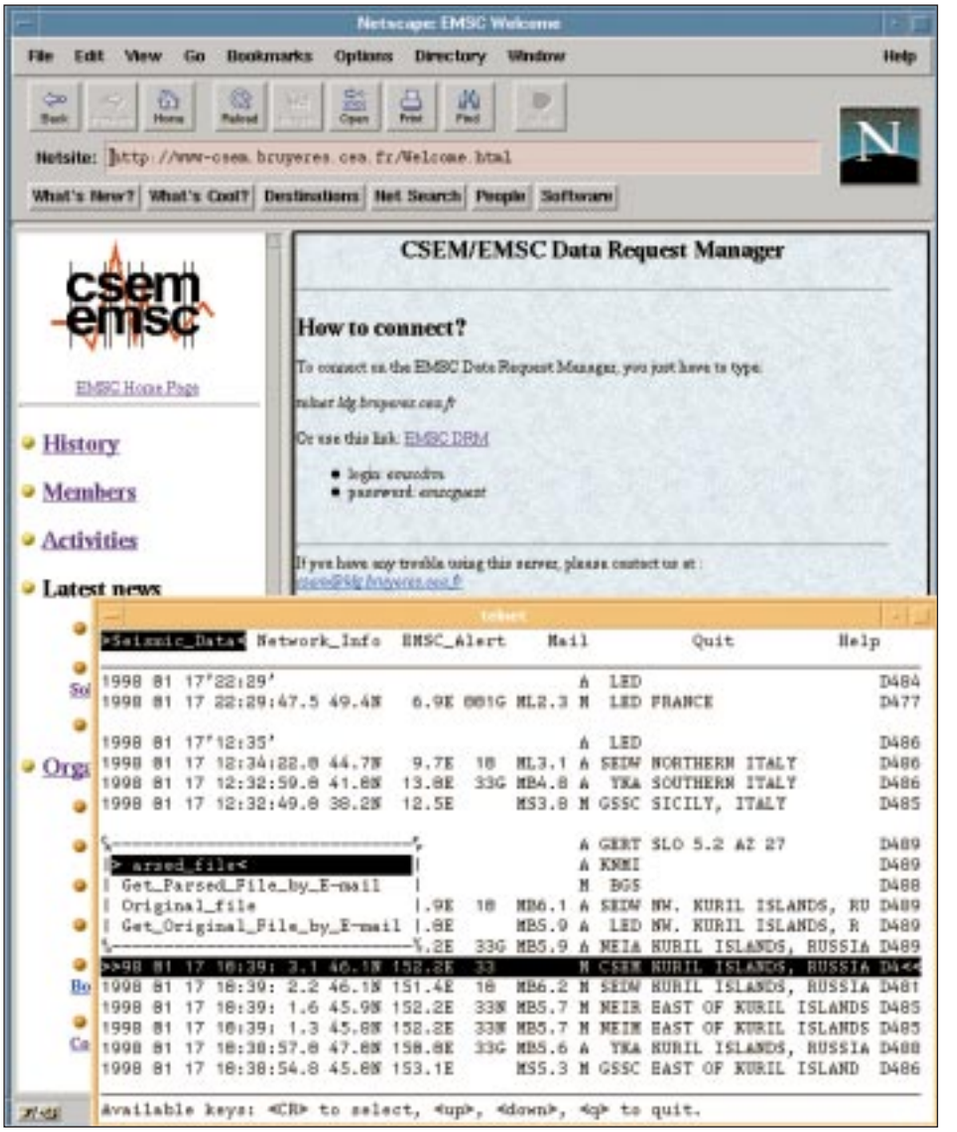

Figure 3 : EMSC Data Request Manager

The future Web of the EMSC

General trend

Currently, a Data Request Manager is available on the Web site. It was developed to provide users with the possibility to access EMSC information through a basic internet connection. It just requires an access to internet and to a telnet session.

Assuming that, in the future, an even larger audience will have access to the Web, additional features will be implemented on the EMSC Web site. The current DRM capabilities will still be available, but all the facilities given by the DRM will also be accessible through the Web.

A tentative schedule for the implementation of those features is given below.

Next month

The current pages will be completed with an improved presentation:

• the Euro-Mediterranean activity map, accessible through the Activities menu item.

• an map will be added to the information on the last event that triggered by the EMSC, under the Dissemination menu item.

• a better presentation of the view to the DRM.

• a catalogue of the last alerts.

Next six months

The following features will be implemented:

• it will be possible to select data based on different criteria such as magnitude or location.

• a link to the data will be added to the DRM and it will be possible to retrieve them by e-mail.

• all information presented on the Web page will be obtainable by e-mail.

• a map of the stations contributing to the EMSC.

• a list of autoDRM e-mail addresses.

• additional links to other institutes.

• a welcome Web Page will be made available to all EMSC members that either cannot access Internet or cannot develop their own Web page.

• more information on the EMSC Activities will be added. In particular, detailed information on the activities of the key nodal members will be provided.

Comments and ideas that could contribute to the improvement of the EMSC Web site are welcome.

SUGGESTION FOR A NEW EARTHQUAKE DATA PARAMETER FILE FORMAT

Jens Havskov Chairman
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Introduction

There is currently not a generally accepted and widely used standard ASCII format for exchange of seismic parameter data (hypocenters, readings, etc). The result is that data are exchanged and stored in a multitude of formats. A direct consequence is that important information often gets lost simply because there is no room for it in the format. The only place where a standard has been maintained is for transmission of data with telegraphs and telexes those requiring a compact and precise formulation. A working group set up under IASPEI has maintained the format and proposed new versions. Currently, two versions are in use, the 'old' and the 'new', however the 'new' version (even though several years old) has never been popular. The telegraphic formats are meant to be compact and easy to use through a telex, but they are completely outdated both in content and in form for current data exchange. The result is that they are used less and less. Therefore, a few years ago, the Working Group started to work on a new format to replace the telegraphic format.

Historically, the most popular formats have been made because of a special program or to respond to a particular need. The HYPO71 format (used with the HYPO71 program) is widely used for simple observations of P and S times for local earthquakes, but it is very limited. The 96 column ISC format is very complete, expandable and used for distribution of ISC data. In principle, it could be used as a new standard although it lacks a few options. However, it was thought at a time when disk space was scarce and its format is hardly readable by humans. It might as well have been binary! The Nordic format was a first attempt to provide a standard, at least on a regional level. It was conceived in agreement between Nordic countries and widely used in Scandinavia and at institutions using the SEISAN processing system. The Nordic format is also expandable, 80 characters long, simple to read but it is too limited to handle all needed parameters. The current GSE 2.0 format is probably the best format in use. It resembles the Nordic format, it is expandable, however the line length is more than 80 characters long, which may be considered impractical. It does not have all the information needed, but it could probably be added. The major drawback is that the original GSE 2.0 format had received little input from the general seismic community.

With this background, the Working Group started to work on a new format. It is largely based on the philosophy of the GSE and Nordic formats, while considering the needs of ISC and the 96 column format. The format has been through 3 revisions with major inputs from the EMSC, the ISC and the NEIC. It is intended to be used primarily for data exchange but it could also be used for data storage. The format will only be used in the future if major agencies like EMSC, NEIC and ISC accept and distribute data in this format.

The purpose of this note is to receive comments from users of seismic parameter data. Is there a need for a new format ? Are there already too many ? And if so, how would you like it to be ? The Working Group does not insist that the fact that the final format should look like the one proposed here; however is it easier to start with some initial suggestions. Comments on the proposed format are strongly encourages and should be addressed to the author.

Format description

The format is meant to be used for exchange of all kinds of seismic parameter data like phases, hypocenters, magnitudes, spectral parameters, etc... as well as most of the output parameters from routine processing. However, it has been designed so that it also could be a suitable format for storing the same information. An example could be the current ISC CDroms. A very important philosophy is that the format must be event based so that operator knowledge is transmitted with the data. If the operator e.g. knows that an event is local or teleseismic, this can make it easier when several data sets are associated, manually or automatically. Since the format is based on lines with line types, it can be expanded infinitely, so in the following, only suggestions for the most basic information has been given. The format should be readable by humans, there is enough disk space available that we do not have to worry about leaving a few blanks here and there.

Basic principles

- Event based;
- Line based with a line type, 80 characters long;
- Only printable characters, no restrictions in general for upper or lower case, although ISC phase convention should be followed but it is probably impossible to enforce;
- Fixed field format used for both input (observations) and output (processed parameters);
- Put the most used parameters first;
- Put spaces between parameters to make the format readable, which may also be used for extra accuracy when needed;
- A message transmitting one or several events will have a start and an end;
- Information should be given to whether the event is judged local, regional or distant. If it is known to be an explosion, it should be indicated also;
- It should be possible to track from which agency the observation comes and whether it is automatically generated, preliminary or final;
- An event has header type lines and phase type lines. The header lines comes first and phase lines follow.

Examples of line types

Header type lines

HYP: Hypocenter line. Header line, the first hypocenter line in file is the primary estimate, has a different line type;
MHY: Same as above, but the first line is for an event;
EHY: Error estimate on the hypocenter, agency identifies which hypocenter line errors belong to;
MAG: Magnitudes with error estimate;
COM: Comment line;
FPP: Fault plane solution including moment tensor;
MAC: Macroseismic information;
WAV: Information on waveform data files, waveform file name and agency;
TIT: Help (title line);
SCO: Station coordinates (now used by the ISC);
MOD: Model used for location etc, could also be contained in the commentline.

Phase type lines

PHI: Phase line, for input parameters only ;
PHO: Phase line, for parameters only.

Line format

On each line, the first 4 characters are used for the line type.
An event must have the header line, no other lines are mandatory. Events are separated by a blank line.

Observations	Number of characters
Station	5
Component	8
Phase onset. I or E	1
Phase, amp-per, azimuth or coda ID	8
Weight used	2
Pick mode (manual, automatic, final..)	2
Polarity	2
Date and time of pick or observation	21
Amplitude or azimuth	8
Period or apparent velocity	5
Error in observation 1	4
Error in observation 2	4
Agency providing the observations	6

• Amplitude is measured in nanometers and written in g-format, so 10 m = 10.000e9 and 1 nm = 1.000000.
• Weight is in format f2.2. This means that 22 = 0.22 and 1. = 1.0. A weight of 9 could be applied for the use of S-P times (HYPO71 convention). Blank should be weight 1.0 (HYPO71 convention).
• If a phase is read and 2 error values are provided, they indicate the range for the uncertainty. If only one value is given, the error is assumed to be symmetric.
• If the period, the amplitude, the azimuth or the apparent velocity are observed, the first error field corresponds to the amplitude or the azimuth and the second error field to the period or the apparent velocity.

Output parameters related to the phases

Station information	Number of characters
Station, identical to input	5
Component, identical to input	8
Blank	1
Phase used for the location	8
Weight used	2
Blank	1
Epicentral distance in degrees (DD) or in km (DK)	8
Blank	1
Azimuth to station indicated by AZ	9
Observation residual	6
Observation residual or magnitude with type	8
Magnitude error	5
Blank	5
Back azimuth indicated by BZ	9

Header line with an hypocenter

Observations	Number of characters
Date and time of origin	20
Event type (Local, volcanic, ... etc); first is L, R or D for local, regional or distant	3
Latitude	8
Longitude	9
Depth	6
Fixing flags (epi. , depth, o. time); F for fixing, p fixed with pP	3
Agency for location and magnitude	5
Number of stations contributing to location	4
RMS of the residuals (if > 99, report 99)	4
Primary magnitude	4
Magnitude type	2
Magnitude error estimate	4
Number of values contributing to the magnitude	4

Since the hypocenter line reports the source of the hypocenters and the magnitudes, several hypocenter lines may be placed anywhere in the file. This is a way to add more magnitudes or other hypocenter solutions for a given event. A special line for the magnitude is also suggested.

Output lines do not show the agency code since calculated values must be from the same agency as reported on the first line. Error estimates for the hypocenter may be reported on a separate line (EHY) with the errors placed below the corresponding values on the hypo-center line. The line could be identified with the agency code.

Start Line

The start is line identified by SEISMOBUL and includes:

information	Number of characters
AGA: Agency sending the data	5
NR: Bulletin number	6
#EV: Number of events in file	8
TIME: Time period of data	21
B: Number of bytes in file	10

End Line

The end line is identified by SEISMOBULEND and includes:

information	Number of characters
AGA: Agency sending the data	5
NR: Bulletin number	6

Example of new parameter file format with 4 reported events *(Figure 1)*

• The first event is an example demonstrating the possibilities in reporting, while the second event shows how little can be reported when only one phase is given.
• The TIT line only shows what is reported and does not need to be sent.
• The third event shows that a local event was recorded but no readings are provided.
• The fourth event just gives the hypocenter of a local explosion.
The format has been arranged so that numbers are aligned as much as possible.
Note that agencies can add all kinds of information with locally defined formats using the COM lines.
Several points still need to be defined or decided:
• Details of last 4 characters of channels code, first 3 is SEED convention
• Define a better way to report on the data processing : automatic, etc...
• There are two characters available for reporting magnitude codes
• May comments be added before the first event to indicate that they apply to the whole file ?
• The two last characters of the event type have to be defined e.g. E for an explosion.

Figure 1 : New parameter file format

```
SEISMOBUL AGA  ISC  NR 23456 #EV 2345678 TIME 9505100000-9505120000 B 1234567890

MHY 1995  510 21 5 16.1 LE  60.240    6.170  30.0FFF BER   586 2.3 3.8ML 0.5 333
EMH BER             5.1        5.3       7.2   2.2    covariance elements
HYP 1995  510 21 5 16.2 LE  61.340    6.270  20.0F   NEIC  200 1.5 3.3MD 0.1  11
MAG 1995  510 21 5 16.1 4.5MD USGS1 0.5 222 5.5MB NEIC2 5.5MB 0.2 444
WAV 8505210425.WNN                                                      BERGE
COM Event was also reported at xxx
TIT STAT COMPONE OPHASE    WE M P YEAR MODA HRMI SEC-- AMP-AZI PE-V ERR ERR AGENC
PHI BERG SZ       IPKP      50 A D 1995 0807 2105 13.44                1.5 .22 NEIC
PHO BERG SZ       IPKPdf    22 DD 120.2 AZ  155.5  -4.6                    BZ  222.0
PHI BERG LZ        AMP-PER     A    1995 0807 2105 13.44    333.3 20.1
PHO BERG LZ        AMP-PER     DD 120.2 AZ  155.5          5.6MB    .4      BZ  222.0
PHI ASR  LZ        AMP-PER     F    1995 0807 2105 13.44 11.11E8 20.2
PHI ASR  SZ        AZI-VEL 10 P    1995 0807 2105 13.44    120.5  6.6 20. 1.1
PHI BER  SZ       IPG            C 1995 0807 2005 25.41
PHI HYA  SZ       ISG       1.   D 1995 0807 2005  33.1
PHI HYA  SZ       IP        33     1995 0907 1105  22.1
PHO HYA  SZ       IPG       22 DK 130.2 AZ  155.5 -11.3                     BZ 111.1
PHI HYA  SZ        CODA        A    1995 0907 1109  24.1
PHO HYA  SZ        CODA       DK 130.2 AZ  155.5       5.6MD   .5      BZ 111.1
PHI HYA  SZ        AZI-VEL     A    1995 0907 1110  22.2     111.1 9.22      BZ 112.0
PHO HYA  SZ        AZI-VEL     DK 130.2 AZ  155.5 -10.1                     BZ 112.0

MHY 1995 0511 21 6 16.1 D                                NEIC    1
TIT STAT COMPONE OPHASE    WE M P YEAR MODA HRMI SEC-- AMP-AZI  P-V ERR ERR AGENC
PHI MOLD SZ       IP                1995 1110 2107 13.44

MHY 1995 0512 22 6 26.1 L                                NEIC    1

MHY 1995 0512 23 5 16.1 LE  62.240    7.170   0.0F   BER     6 2.3 3.8ML 0.5   3

SEISMOBULEND AGA  ISC NR 123456
```

THE GEOSCOPE PROGRAM AND ITS DATA CENTER

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Introduction

The GEOSCOPE program was the first to undertake the installation of worldwide broadband network. It is devoted to the study of the Earth's deep internal structure and the mechanisms involved in earthquake generation. The GEOSCOPE network presently consists of 28 stations well distributed worldwide, in particular in the southern hemisphere (Figure 1). Each station is equipped with broadband three component Streickeisen seismometers and, except for 2 stations, is operating in the VBB (Very Broad band) configuration (144db, 24bits). Within four years, data from ten of these 28 stations will be broadcasted by satellite in real time.

GEOSCOPE Data Center

During the last years, we focused our efforts on the accessibility of data. They may be accessed by different means:

- the WWW GEOSCOPE server http://geoscope.ipgp.jussieu.fr where data are available on-line. This site also provides all information about the network, the stations, the channels, the transfer functions since the beginning of the network operation and the plots of seismic noise levels for every station;
- the anonymous ftp site : geoscope.ipgp.jussieu.fr;
- the GEOSCOPE AutoDRM (Automatic Data Request Management) with e-mail-based requests submitted to geoscope@ipgp.jussieu.fr;
- CDroms freely available;
- the IRIS/SPYDER system for large earthquakes (magnitude greater than 6.5);
- in a near future, data will also be accessible through the NetDC system or Networked Data Centers as proposed by the IRIS Group of Seattle.

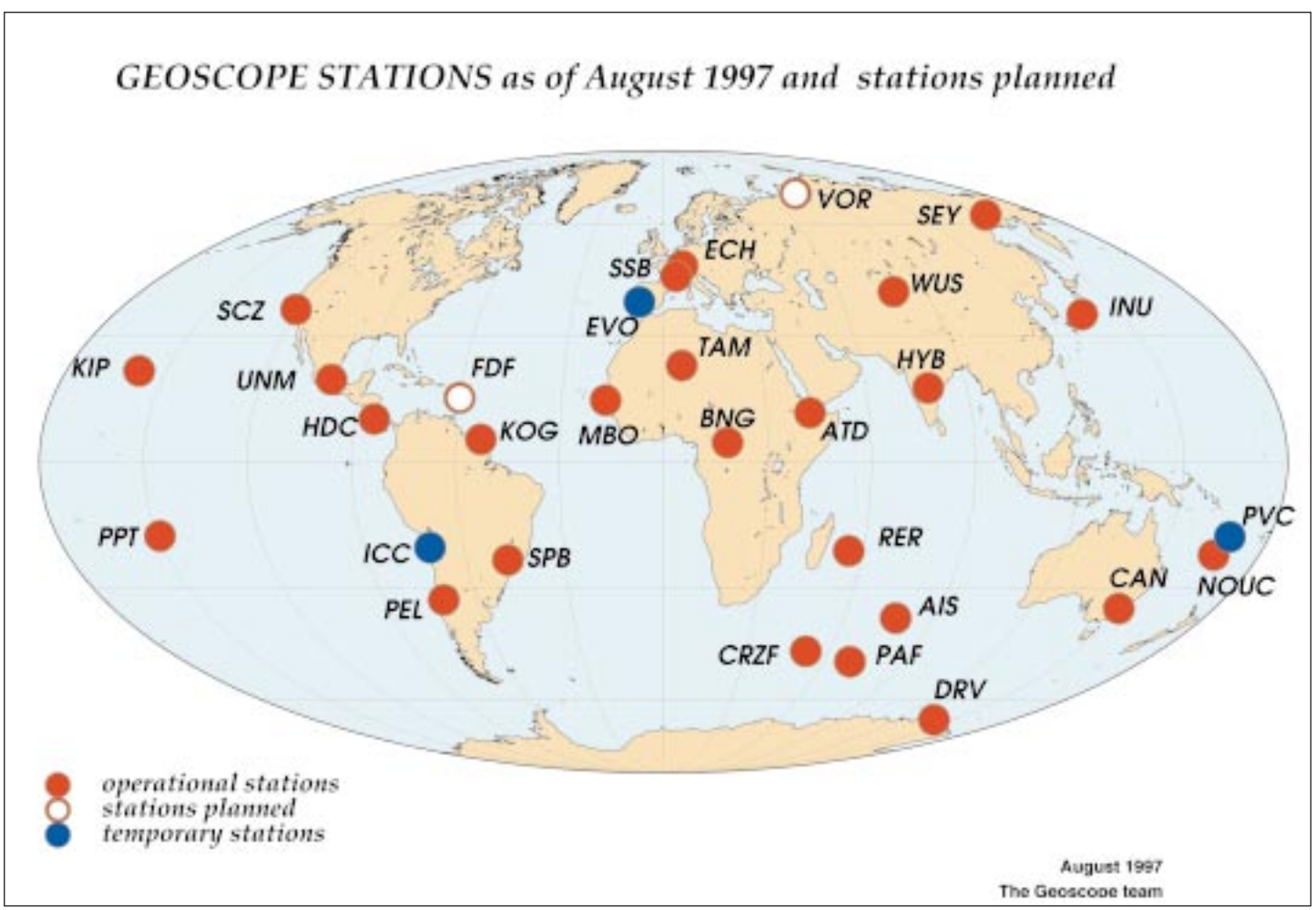

Figure 1: GEOSCOPE stations as of October 1997

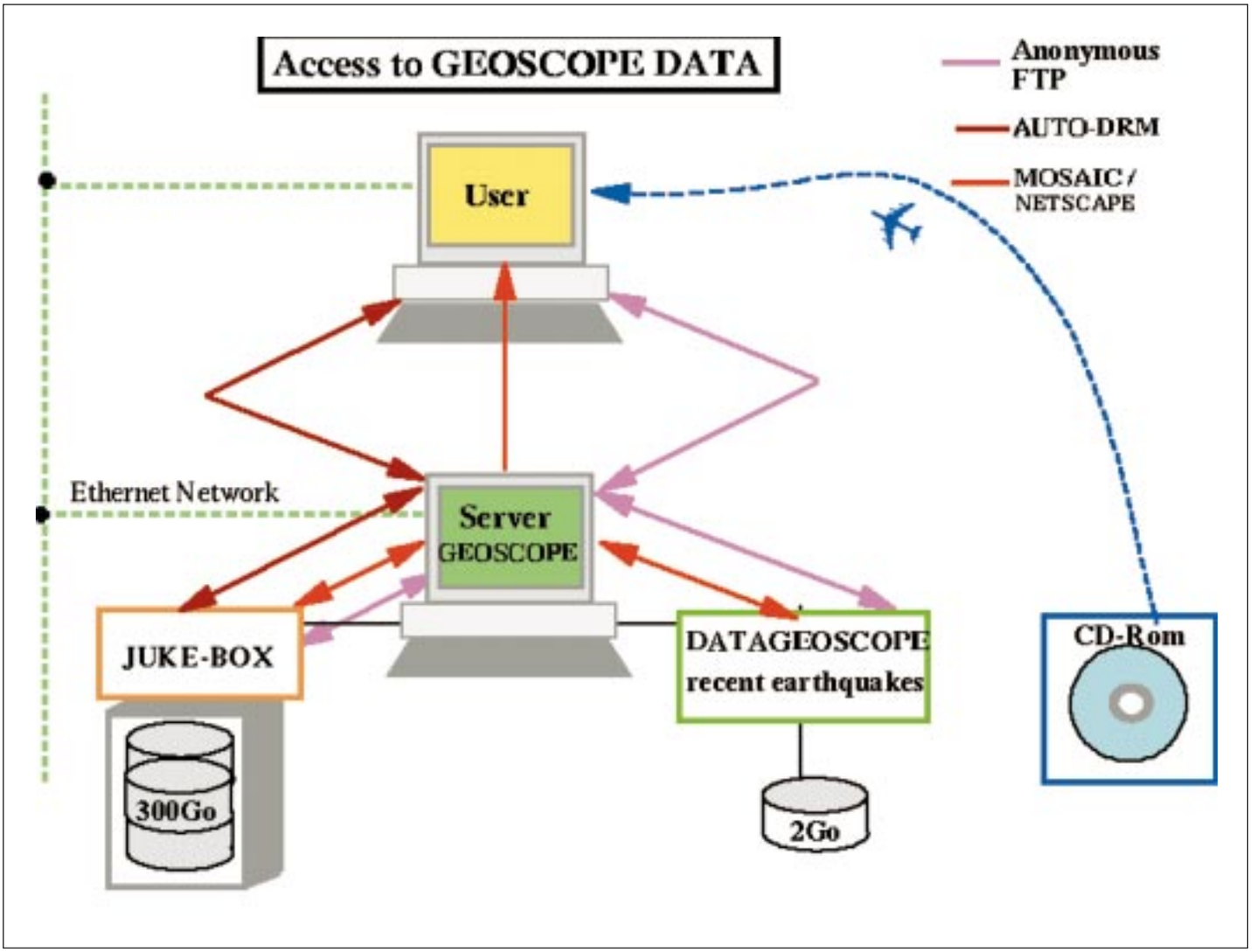

Figure 2: How to access GEOSCOPE data?

Figure 2 summarizes the different ways for accessing the GEOSCOPE Data Center or for obtaining data.
Since 1992, the GEOSCOPE Data Center has been organized around the master piece of the Center, a juke-box of 300Gbytes. Since 1982, all incoming data have been stored on the juke-box after data quality control and time corrections have been performed. In order to facilitate the exchange of data with the scientific community, the juke-box is widely open to external users and data are easily accessible by using our anonymous ftp site.

The data are also written on CDrom in SEED format (Standard for Exchange of Earthquake Data). So far, 27 CDroms, with data spanning the period from March 1982 to July 1991, have been widely distributed. About 100 institutes are currently receiving these CDroms. Our next objective is to produce CDrom for the period 1991-1996.

Data from 15 stations for all recent earthquakes with magnitude greater than 6.5
or of particular interest are broadcasted to the Data Center of St Maur. These data
(for the two channels VH and MH, respectively recorded at 0.1sps and 5sps) are available on GEOSCOPE WWW server or on the ftp site at the Data Center of Paris
within one day.

The Future

In the framework of the new program Geoscope2000, all stations will be upgraded, with a new digitizer (24bits, BH channels continuously recorded at 20 sps), and additional sensors (microbarometer, millithermometer,...) will be installed at the same time. The satellite links will be developed in cooperation with the French Agency CEA/DASE, in order to broadcast seismic data in quasi-real time. Finally, in order to achieve a real uniform global coverage, the GEOSCOPE network will be complemented by a network of GOBOS (Geophysical Ocean Bottom Observation Stations. The data provided by the GOBOS will be stored at the GEOSCOPE Data Center. A description of these future plans is given in Montagner et al. (1998).

References

Montagner, J.-P., P. Lognonné, G. Roult, J.-F. Karczewski, E. Stutzmann, and R. Beauduin.
Towards a new generation of Digital Seismograph Networks for the next century: the French efforts, Phys. Earth Planet. Int., In press, 1998.

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EMSC members

We are planning to dedicate the next EMSC Newsletter to the use of autoDRM as a tool for data exchange. Please, send us your autoDRM address and the EMSC will forward you a questionnaire regarding its features. Thank you in advance for your collaboration.

Synop6 - Nancy