

## A « Web tool »

to give access to geodetic time series

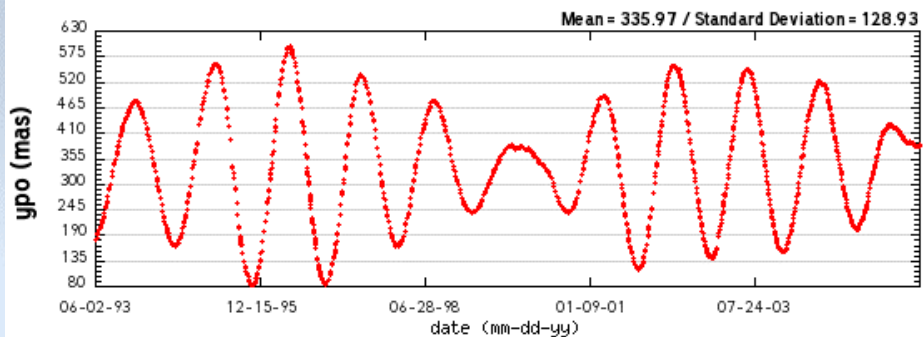
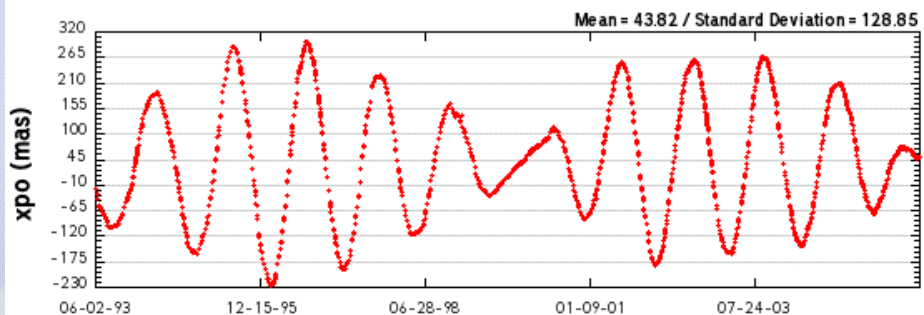
**Florent Deleflie, and the « GMC Team »  
(F. Barlier, P. Berio, P. Bonnefond, P. Exertier,  
D. Féraudy, O. Laurain, G. Métris,  
Y. Vanderschueren)**

Special thanks to X. Collilieux and Z. Altamimi (IGN/LAREG)

# Time series viewer

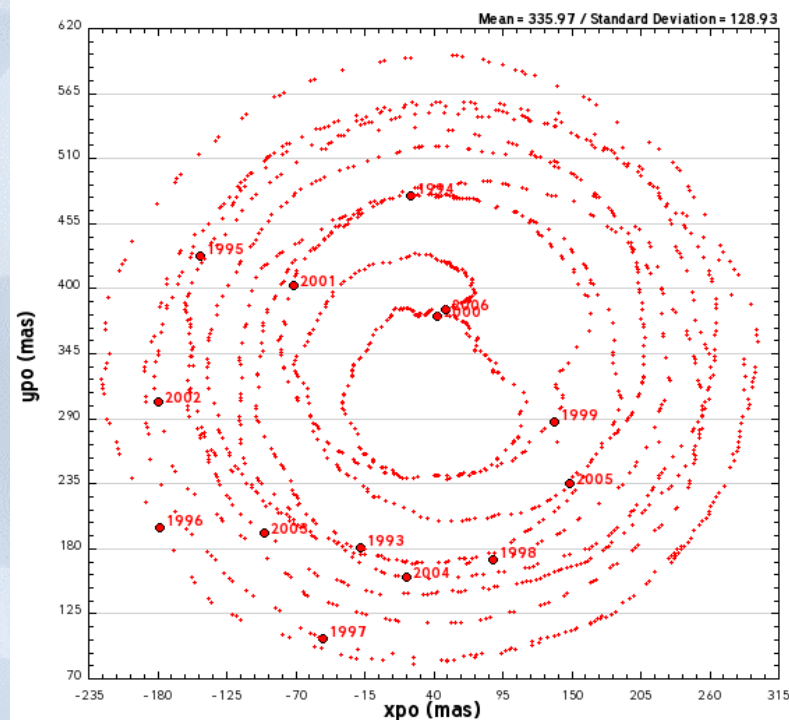
- For one technic:

## EOP: Coordinates



Solution: IVS  
Technic: VLBI  
Analysis Center: IVS/IGN  
1514 data from 06-02-93 to 02-03-06  
Plot date: 09-30-06

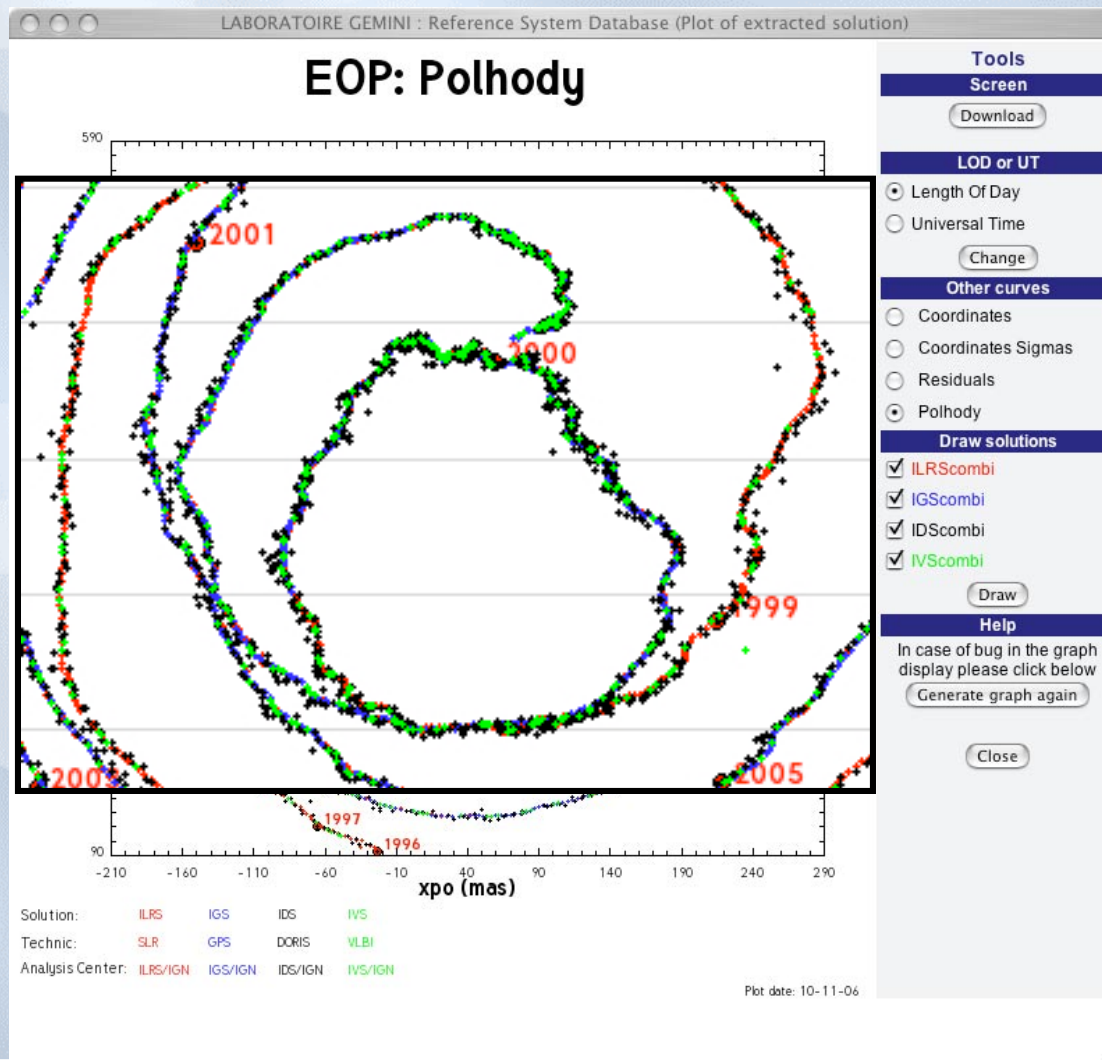
## EOP: Polhody



Solution: IVS  
Technic: VLBI  
Analysis Center: IVS/IGN  
1514 data from 06-02-93 to 02-03-06  
Plot date: 09-30-06

# Time series viewer

- For several technics:



# Scientific goals

- **To make solutions of geodetic products be comparable in an homogeneous way**
- **Develop webservice to directly interact within scientific analysis softwares**
- **Develop an efficient interface between different scientific communities linked to geodesy**
  - Between geophysic and astronomy
  - ...

# Principles of the tool

## Requirements:

- **The tool extracts and shows:**
  - Times series of geodetic products:
    - **EOP**
    - **Stations positions**
    - **Transformation parameters**
  - Over a period chosen by the user
  - Output: ASCII or VO-Table
- **The tool has to:**
  - Be easy to use
  - Be compatible with different Web browsers...
  - Be made up of independant sub-programs,
  - Be securised
  - Give results quickly

# The VO-concept

- **Use of data where they are stocked : VO-Table format (XML)**
  - To facilitate links between communities
  - Data need not to be duplicated
  
- **Webservices**
  - Compatibility between external software ensured by VO-Table format
  - Existing tools: TOP-CAT, VO-Plot

## Format: Ascii

date	soln	resph	sigph	reslb	siglb	resh	sigh
2001.84794520547939	1	37.9	54.86	8	44.77	1	55.87
2002.39589041095883	1	51.1	27.71	41.1	33.36	24.5	24.55

## Format: VO-Table

```

<FIELD unit="year" datatype="double" name="date"/>
<FIELD unit="ind" datatype="double" name="soln"/>
<FIELD unit="nan" datatype="double" name="resph"/>
<FIELD unit="nan" datatype="double" name="sigph"/>
<FIELD unit="nan" datatype="double" name="reslb"/>
<FIELD unit="nan" datatype="double" name="siglb"/>
<FIELD unit="nan" datatype="double" name="resh"/>
<FIELD unit="nan" datatype="double" name="sigh"/>
<DATA>
  <TABLEDATA>
    <TR>
      <TD>2001.84794520547939</TD>
      <TD>1</TD>
      <TD>37.9</TD>
      <TD>54.86</TD>
      <TD>8</TD>
      <TD>44.77</TD>
      <TD>1</TD>
      <TD>55.87</TD>
    </TR>
  </TABLEDATA>

```

# Technical points

- **« INPUT solutions » have to be transformed to be compared:**
  - Homogeneous reference frames
  - We used the CATREF software, but other ones can be used
- **Our database:**
  - Contains solutions realized in an homogeneous reference frame over a given period of time (e.g. only one position and velocity per period for a station)
  - Is a PostGre SQL DB which gives access to:
    - **Time series per technic or analysis center**
    - **All solutions (per technic or analysis center) available for a given parameter**





laboratoire GEMINI du CNRS et département de l'OCA

- présentation du labo
- équipes
- doctorants
- thèmes de recherche
- projets et instruments
- publications
- observations & données**

# Reference System Database

Reference System  
Query by technic  
Query by parameters

Cart (0)  
Logout

Help

Choose another technic

Stations: 651

Unselected Stations: 0

Selected Stations: 651

	>>	1311A 40424S001 KAUAI 9-m at Kokee
	>	1404A 41705S006 SANTI12 12-m at Santi
	<	1513A 40405S014 GOLDFENU This antenna
	<<	1515A 40405S019 DSS15 34-m HEF at G
		1543A 50103S001 TIDBIN64 70-m DSS43 at

Double-click to select

Double-click to unselect

Start date:

8 4 1979

End date:

2 2 2006

Positions

Velocities

Residuals time series

Reset Parameters

Submit

EOP: 5 solutions

Start date:

1 3

1993

End date:

12 31

2005

Polar Motion

XP/YP residuals

UT

UT residuals

LOD

LOD residuals

Reset Parameters

Submit

Transformation parameters: 5 solutions

Start date:

12 31

1992

End date:

12 30

2005

Translations, Rotations and Scale factor

Reset Parameters

Submit



laboratoire GEMINI du CNRS et département de l'OCA

[présentation du labo](#)
[équipes](#)
[doctorants](#)
[thèmes de recherche](#)
[projets et instruments](#)
[publications](#)
[observations & données](#)

# Reference System Database

Reference System  
Query by technic  
Query by parameters

Cart (0)  
Logout

Help

## Stations parameters

Summary of the request		Navigation
Number of solutions	5	<input type="button" value="Add to your cart"/>
Dates	8-4-1979 to 2-2-2006	<input type="button" value="Choose another technic"/>
Positions fields	soln, stax, sigstax, stay, sigstay, staz, sigstaz, velx, sigvelx, vely, sigvely, velz, sigvelz	<input type="button" value="Continue your query"/>
Residuals time series fields	soln, resph, sighp, reslb, siglb, resh, sigh	

## Results

Technic: SLR						
Name	Type	In charge	Software	Analysis center	Constraints	Develop stations
ILRS	combined	Z.Altamimi	CATREF	ILRS/IGN	loose	<a href="#">88 Stations</a>
ASI	individual	C.Luceri	GEODYNII/SOLVE/CATREF	ASI	loose	<a href="#">35 Stations</a>
Technic: GPS						
Name	Type	In charge	Software	Analysis center	Constraints	Develop stations
IGS	combined	Z.Altamimi	CATREF	IGS/IGN	loose	<a href="#">303 Stations</a>
Technic: DORIS						
Name	Type	In charge	Software	Analysis center	Constraints	Develop stations
IDS	combined	Z.Altamimi	CATREF	IDS/IGN	loose	<a href="#">114 Stations</a>
Technic: VLBI						
Name	Type	In charge	Software	Analysis center	Constraints	Develop stations
IVS	combined	Z.Altamimi	CATREF	IVS/IGN	loose	<a href="#">150 Stations</a>

## Tools

### Zip and Download data

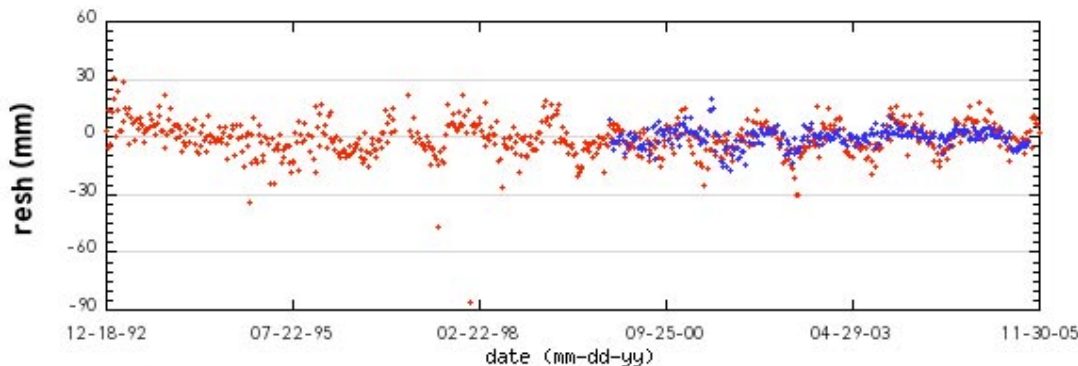
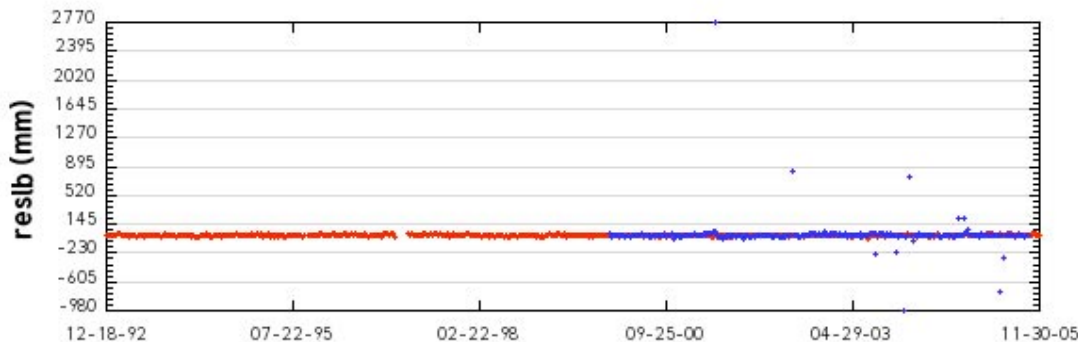
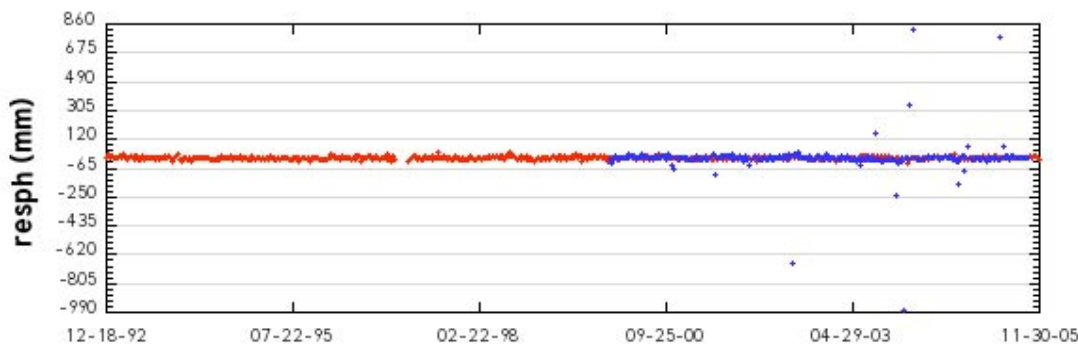
Please select the downloading format

 All

 Votable

 Ascii

# Station 7090A / 50107M001



Solution: ILRS ASI  
Technic: SLR SLR  
Analysis Center: ILRS/IGN ASI

Plot date: 10-11-06

### Tools

#### Screen

Download

#### Draw solutions

ILRScombi

SxAsiindiv

Draw

#### Help

In case of bug in the graph display please click below

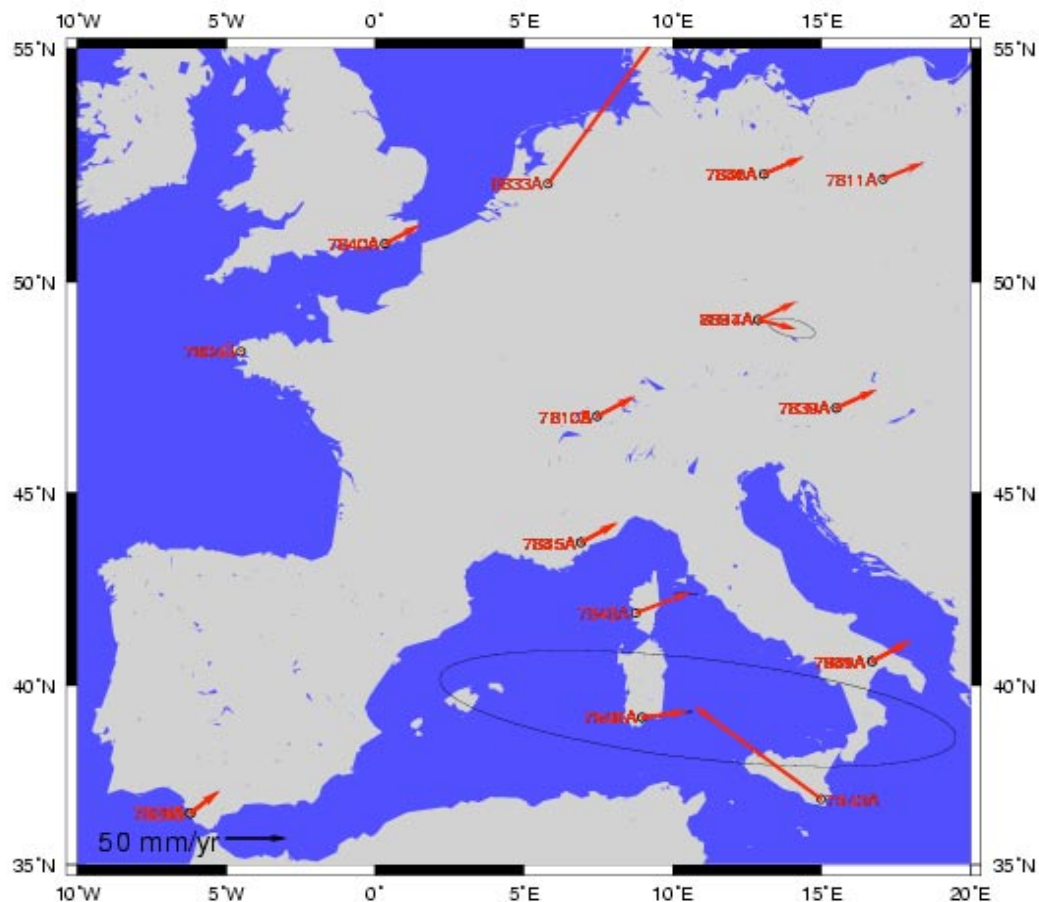
Generate graph again

Close

GRGS

de  
ches de  
sie  
e

### Stations Horizontal Velocities



**Tools**

**Screen**

Download

---

**Other curves**

Stations network  
 Horizontal velocities  
 Vertical velocities

Draw

---

**Map parameters**

Longitude: Min:  Max:

Latitude: Min:  Max:

(leave field(s) blank for automatic sizing)

View station number

Generate graph again

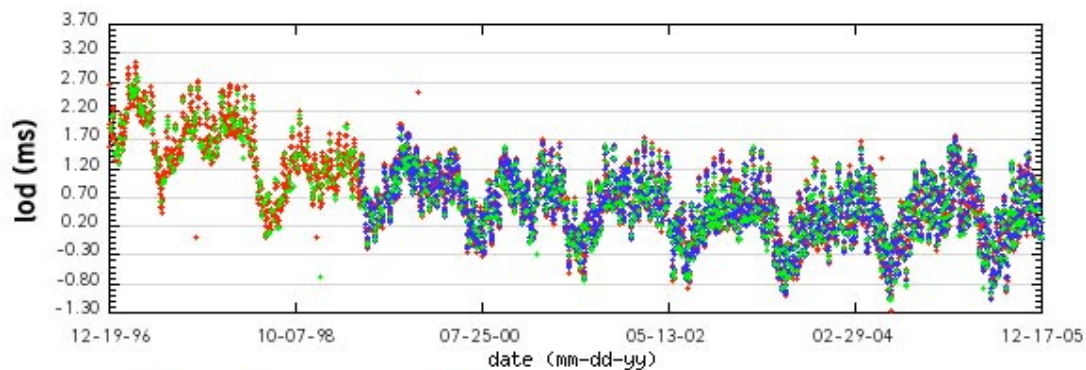
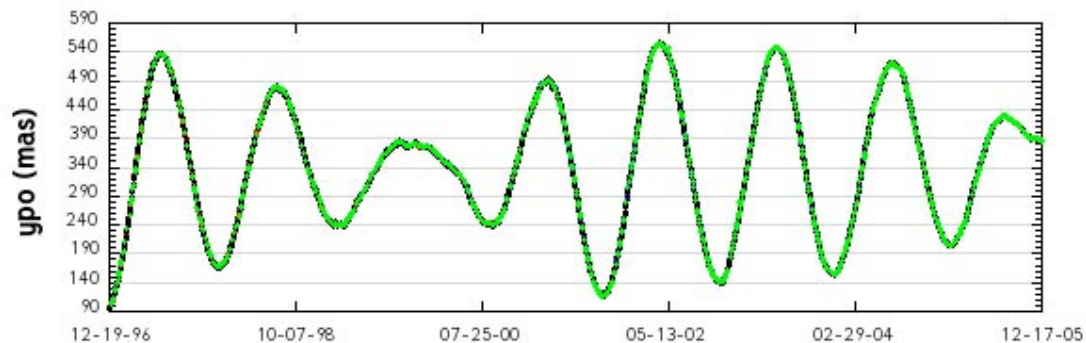
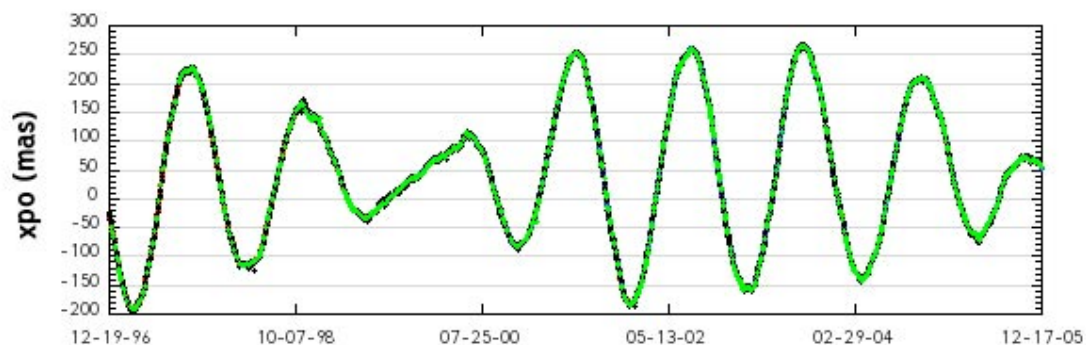
Close

**Reference System DataBase**

88 stations from solution ILRScombi (SLR) obtain in Gemini Reference System DataBase. The reference time for this network is 192451544.5.

[http://www.obs-azur.fr/gemini/donnees/sys\\_ref/sys\\_ref.php](http://www.obs-azur.fr/gemini/donnees/sys_ref/sys_ref.php)

# EOP: Coordinates



Solution:    ILRS    IGS    IDS    IVS  
 Technic:    SLR    GPS    DORIS    VLBI  
 Analysis Center: ILRS/IGN    IGS/IGN    IDS/IGN    IVS/IGN

Plot date: 10-11-06

## Tools

### Screen

Download

### LOD or UT

Length Of Day

Universal Time

Change

### Other curves

Coordinates

Coordinates Sigmas

Residuals

Polhody

### Draw solutions

ILRScombi

IGScombi

IDScombi

IVScombi

Draw

### Help

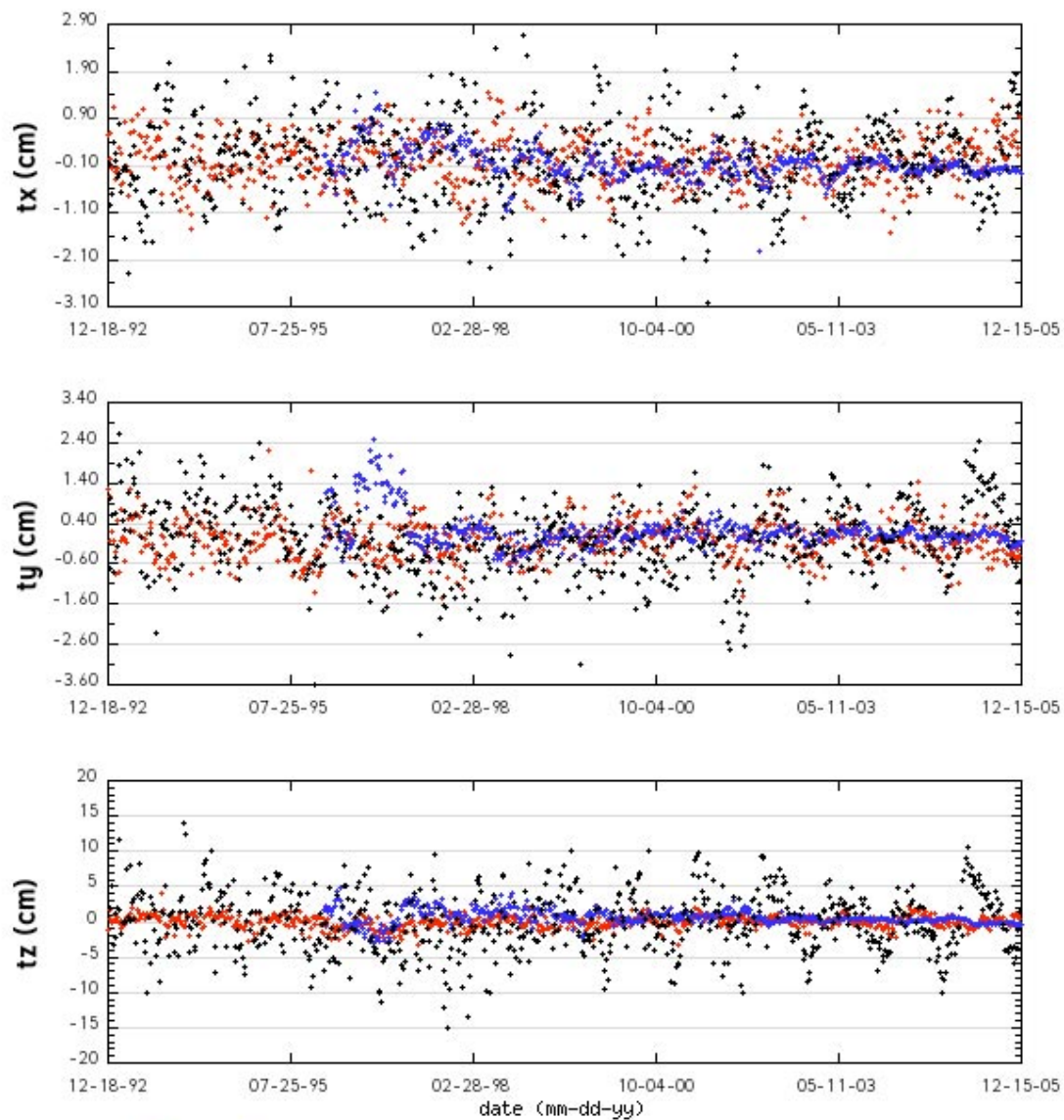
In case of bug in the graph display please click below

Generate graph again

Close

Google

# Transformation Parameters: T



Solution:    **ILRS**    **IGS**    **IDS**  
 Technic:    **SLR**    **GPS**    **DORIS**  
 Analysis Center: **ILRS/IGN**    **IGS/IGN**    **IDS/IGN**

Plot date: 10-11-06

## Tools

### Screen

Download

### Other curves

- Translations (T)
- Rotations (R)
- Scale Factor (D)
- Translations Sigmas (TS)
- Rotations Sigmas (RS)
- Scale Factor Sigmas (DS)

### Draw solutions

- ILRScombi
- IGScombi
- IDScombi
- IVScombi

Draw

### Help

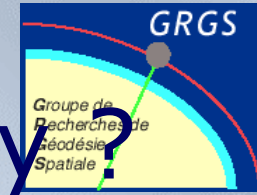
In case of bug in the graph display please click below

Generate graph again

Close

## The future... for that tool...

- **Work still in progress on time series...**
  - Comparisons: combined solutions or per technic
  - ITRF and EOP-C04
- **Work still in progress on « interoperability concepts »**
  - VO-Table format
- **We would like to be allowed by ILRS to build in the database the solutions provided by official analysis centers**



# The future... for the community?

- **We would like to provide this tool to ILRS**
- **We think it should be interesting to:**
  - get a database where all solutions can easily be obtained (a « centralized database » is not mandatory through webservice and VO-Table format)
  - Develop webservice to directly interact within scientific analysis softwares
- **Technical constraints**
  - To get (part of) these solutions in a standard format (VO-Table ?)
- **Links with GGOS...**



# Conclusion

## 3.3 Fonctionnement de l'outil

- Page de gestion du panier :

**GEMINI**  
UMR6203

Reference System  
Query by solution

Cart (4)  
Logout

---

Help

# Reference System Database

# Request	Type (# of data)	Selected Dates	Solution	Technic	Delete
<a href="#">001</a>	Transfo (302)	12-30-1999 to 10-19-2005	SxAsiindiv	LASER	<input type="checkbox"/>
<a href="#">002</a>	Stations (9)	12-30-1999 to 10-19-2005	SxAsiindiv	LASER	<input type="checkbox"/>
<a href="#">003</a>	EOP (3994)	1-8-1995 to 12-24-2005	test2indiv	LASER	<input type="checkbox"/>
<a href="#">004</a>	Transfo (102)	1-12-2002 to 12-29-2003	test1indiv	LASER	<input type="checkbox"/>

**Tools**

**Zip and Download data**

Please select the downloading format

All     
  Votable     
  Ascii