

Estimation of hourly ERP

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Estimation of hourly ERP

precession-
nutation

1. low-frequency wobble

The Earth rotation

2. high-frequency excitation

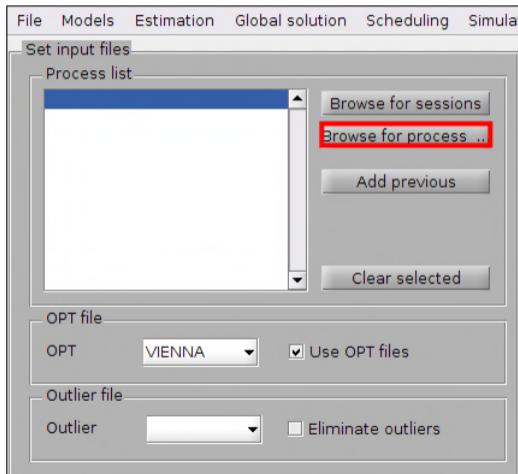
polar motion
and dUT1
variations

PM: $-1.5 \text{ cpsd} > \text{frequency in ITRF} > -0.5 \text{ cpsd}$
precession-nutation: $-0.5 \text{ cpsd} < \text{frequency in GCRS} < 0.5 \text{ cpsd}$

Regular process of single session

—> Processlist Name
(exercise_sesslist.mat)

session
selection

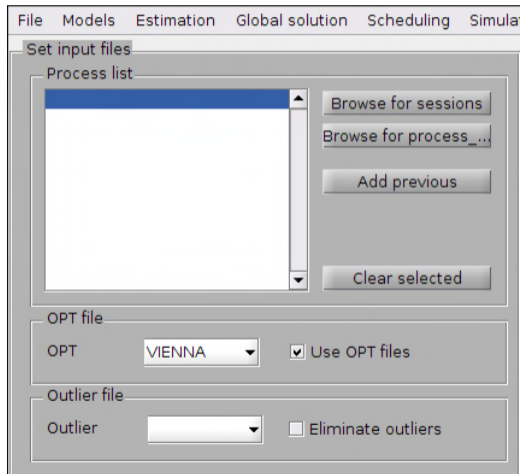


Regular process of single session

- > Processlist Name
(exercise_sesslist.mat)
- > Load parameters

session
selection

parameters
selection



Regular process of single session

File Models Estimation Global solution Scheduling Sir

EOP

A priori time series

- 05 C04
- 08 C04
- finals
- other

include a priori celestial pole offsets

Models

Include high frequency

- Ocean tides
- Libration (xp, yp) 10 terms
- Libration (UT1) 11 terms

Precession/Nutation model

- IAU 2000A
- IAU 2006/2000A

Interpolation

- linear
- lagrange

- Tidal UT variations (RG_Z...
- UT1R <3...
- UT1S all constituents

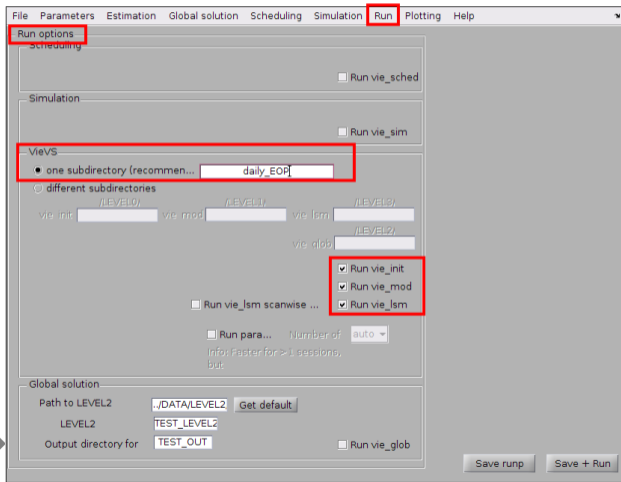
File Models Estimation Global solution Scheduling Simulation Run Plotting Help

EOP estimation **least squares**

	estimation interval	relative	
<input checked="" type="checkbox"/> Estimate Xpol (inter. pole coord. in TRF)	1440	<input checked="" type="checkbox"/> constraints [mas]	1.0e-4 after 1440
<input checked="" type="checkbox"/> Estimate Ypol (inter. pole coord. in TRF)	1440	<input checked="" type="checkbox"/> constraints [mas]	1.0e-4 after 1440
<input checked="" type="checkbox"/> Estimate dUT1 (rotation angle)	1440	<input checked="" type="checkbox"/> constraints [mas]	1.0e-4 after 1440
<input checked="" type="checkbox"/> Estimate nutdx (CIP coord. in celes. long.)	1440	<input checked="" type="checkbox"/> constraints [mas]	1.0e-4 after 1440
<input checked="" type="checkbox"/> Estimate nutdy (CIP coord. in obliquity)	1440	<input checked="" type="checkbox"/> constraints [mas]	1.0e-4 after 1440

Celestial pole offsets estimation!

Regular process of single session



Using external function /OUT/eop_out.m

```
function eop_out
```

Using external function /OUT/eop_out.m

function eop_out

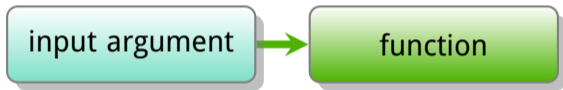


Using external function /OUT/eop_out.m

function eop_out



Arguments of /OUT/eop_out.m



Welcome to MATLAB terminal!

Arguments of /OUT/eop_out.m: first



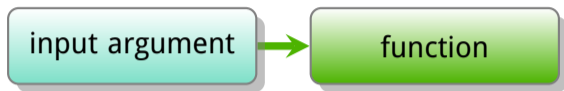
Welcome to MATLAB terminal!

```
/WORK/PROCESSLIST/ > load('exercise_sesslist.mat');
```

!*name of appeared variable in WorkSpace must be the first argument for eop_out.m (in the example: **process_list**) *!

```
> function eop_out(process_list, subdir,  
file_name,output_mode);
```

Arguments of /OUT/eop_out.m: second



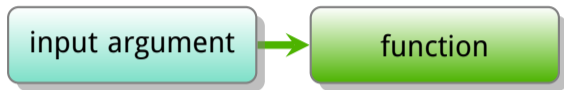
Welcome to MATLAB terminal!

```
> subdir = 'daily_EOP';
```

```
!*name of nonempty directory /DATA/LEVEL3/subdir/ is output  
directory for regular process of single session (daily EOP resolution) *!
```

```
> function eop_out(process_list, subdir,  
file_name,output_mode);
```

Arguments of /OUT/eop_out.m: third



Welcome to MATLAB terminal!

- > `file_name = 'filename.txt';`
- > `output_mode = [1,0,0];` (optional argument, default settings)

- > `function eop_out(process_list, subdir, file_name, output_mode);`

Arguments of /OUT/eop_out.m

```
eop_out(process_list,'daily_ERP','filename.txt',[1,0,0]);
```

Description: in Matlab

1 = true (= estimate);

0 = false (= not estimate or not include).

output_mode = [first_cell,0,0];



first_cell = 1: detailed EOP file (as before);

```
1 %*****
2 % Columns:
3 %      1      .... mjd
4 %      2-6    .... total values(x,y,ut,dX,dY)
5 %      7-11   .... a priori EOP (input in vie_mod)
6 %      11-16  .... estimated values
7 %      17-21  .... error of estimation
8 %      22-24  .... high frequency (subdaily) ERP corrections
9 %
10 % all units in mas resp. ms (dut1)
11 %*****
```

output_mode = [0,second_cell,0];



second_cell = 1: Sorted EOP file (sorted by date,
multiple entries are thrown out);

```
1 %*****  
2 % Columns:  
3 %      1      .... mjd  
4 %      2-6    .... total values(x,y,ut,dX,dY)  
5 % all units in mas resp. ms (dut1)  
6 %*****  
7 % MJD  xpol  ypol  dut1  dX  dY
```


output_mode = [0,0,third_cell];



third_cell = 1: VieVS specific format (internal VieVS format)

```
1 %*****
2 % Columns:
3 %      1      .... mjd
4 %      2-6    .... total values(x,y,ut,dX,dY)
5 % all units in mas resp. ms (dut1)
6 %*****
7 % MJD xpol ypol dut1 dX dY
```

Save results: a priori model in /EOP/

finally, MATLAB terminal:

```
> eop_out(process_list,'daily_ERP','filename.txt',[1,1,1]);
```

Save results: a priori model in /EOP/

finally, MATLAB terminal:

```
> eop_out(process_list,'daily_ERP','filename.txt',[1,1,1]);
```

This is saved in /OUT/

Save results: a priori model in /EOP/

finally, MATLAB terminal:

```
> eop_out(process_list,'daily_ERP','filename.txt',[1,1,1]);
```

This is saved in /OUT/

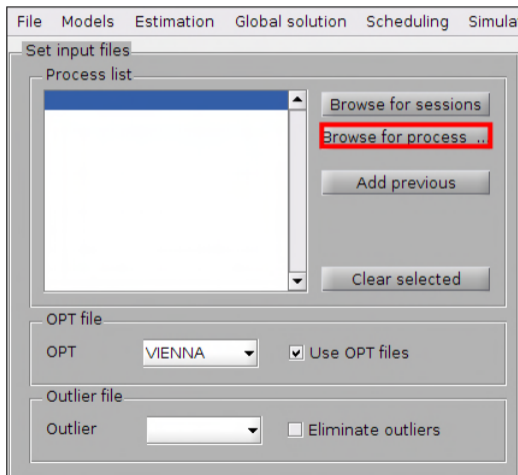
remove it in directory /EOP/

/EOP/ includes all of available EOP data

Regular process: hourly resolution ERP

Let's come back into /WORK/
and, *secondly*, GUI interface
—> Processlist Name
(exercise_sesslist.mat)

session
selection

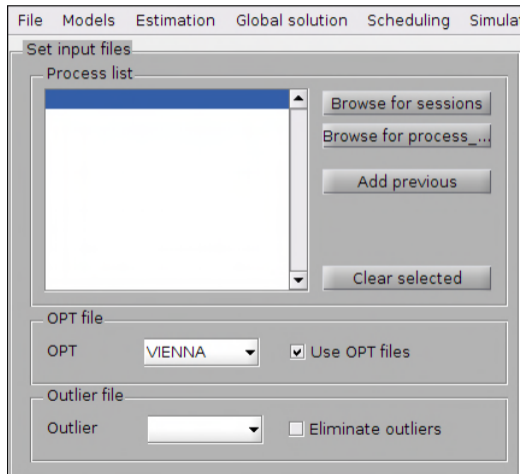


Regular process: hourly resolution ERP

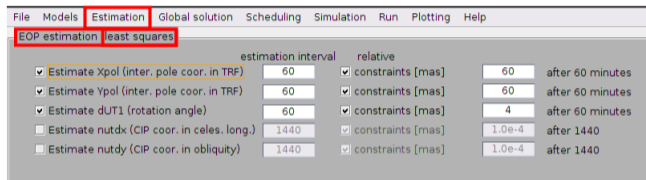
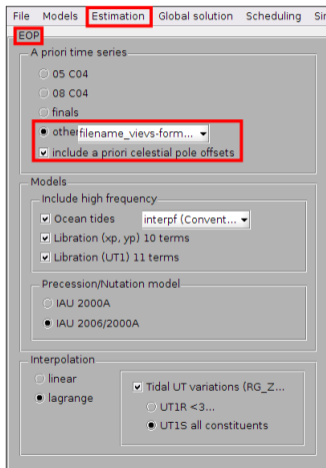
- > Processlist Name
(exercise_sesslist.mat)
- > Load parameters

session
selection

parameters
selection



Regular process: hourly resolution ERP

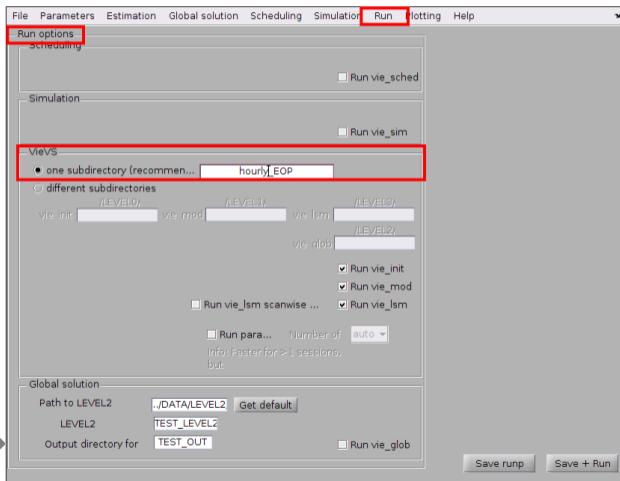


Tips: File—> reload folders

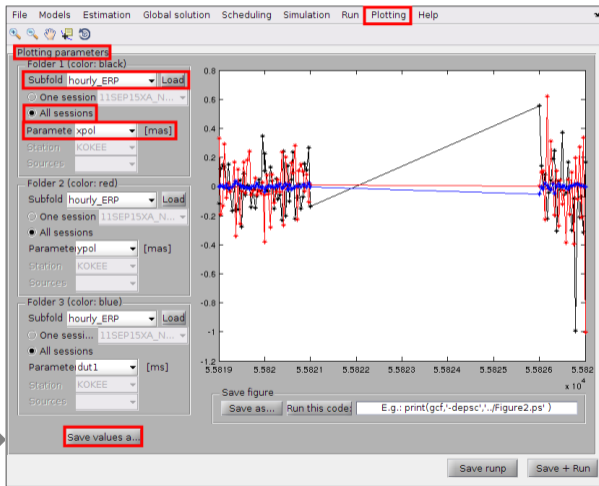
/EOP/filename_views-format.txt

high-frequency ERP estimation!

Regular process: hourly resolution ERP



Regular process: visual interface



Regular process: find your results

- ↪ output directory is suggested by VieVS GUI
 .txt-file
- ↪ /DATA/LEVEL3/subfolder
 x_session_name.mat

Thank you for your attention!

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