

Out of Memory



- Most affected system
 - Buy more RAM
 - Use option “use memory mapped arrays”
 - Close all programs, remove Windows services (Adobe etc...), reboot
 - Try different memory manager “start Matlab from the DOS command line with *matlab –memmgr fast* option
 - Use older Matlab versions (how old?)
 - Change of OS (Windows 8 vs 7)
 - Look at <http://www.mathworks.com/support/tech-notes/1100/1107.html>
- OSx and Unix/Linux
 - Buy more RAM
 - Matlab cannot allocated inactive memory. To free it, type *du -sx /*

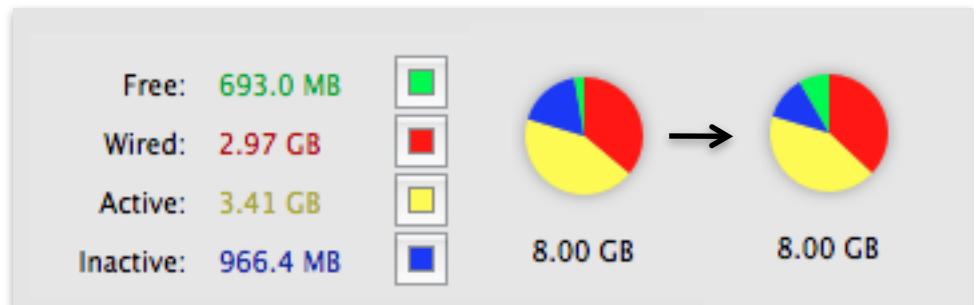


Figure problem and export



For crashes, freezes, etc... use a non OpenGL renderer

At startup type in `set(0,'defaultfigurerenderer','zbuffer')` or
`set(0,'defaultfigurerenderer','painter')`. Note that these cannot handle transparency and 3-D graphics or type “opengl software”

To export figures for publication, use .eps format (postscript) and edit for instance with adobe illustrator. Use “`set(gcf, 'renderer', 'painter')`” before exporting complex figures. Use the “`plot2svg`” matlab toolbox to export figure for transparency.

EEGLAB documentation

EEGLAB Home Page

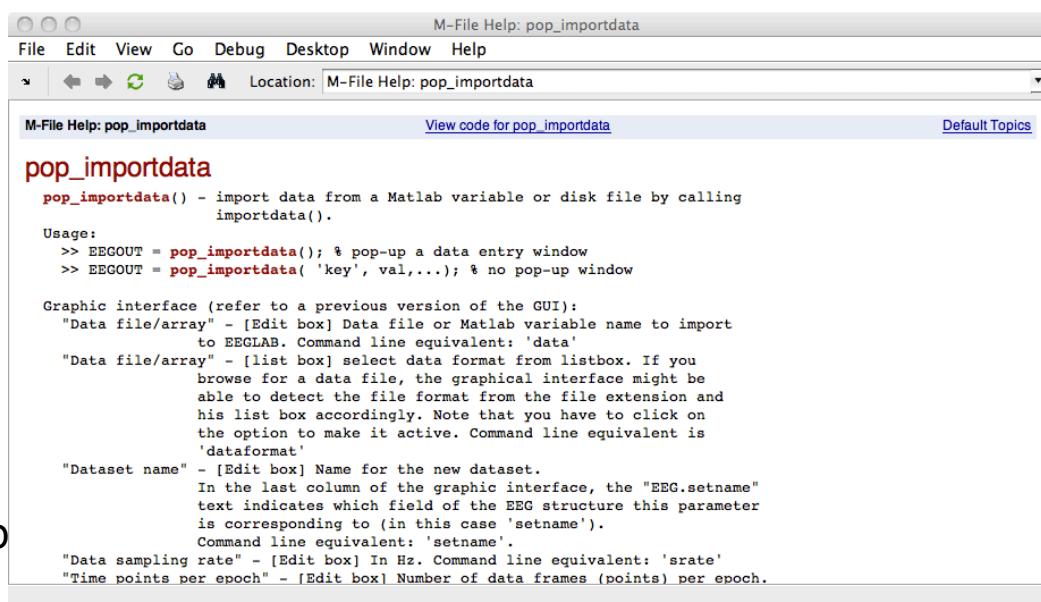
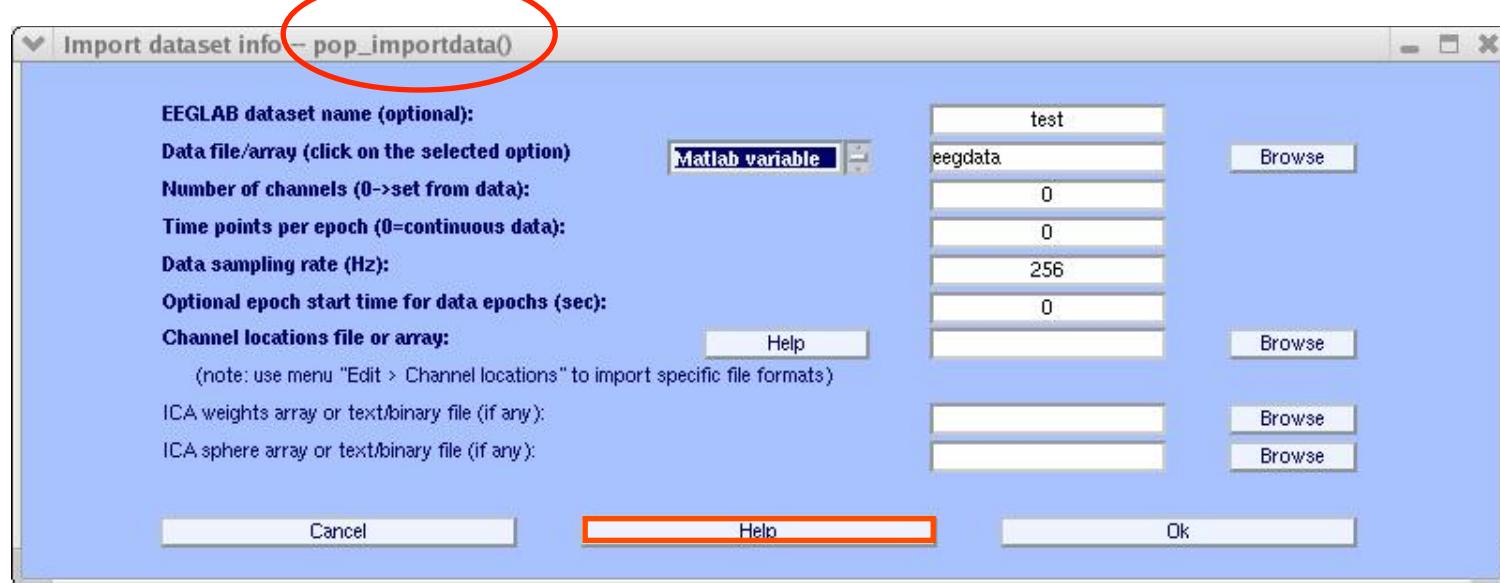
sccn.ucsd.edu/eeglab/

EEGLAB Tutorial Index

sccn.ucsd.edu/wiki/EEGLAB

- 200 pages of tutorial (including “how to” for plugins) WEB or PDF
- Function documentation (next slide)
- Send questions to the mailing list eeglablist@sccn.ucsd.edu
(or search mailing list archive using google)
- Bug submission <http://sccn.ucsd.edu/eeglab/bugzilla>
- Email us (suggestions) eeglab@sccn.ucsd.edu
- Workshop with practicum every year

Help message

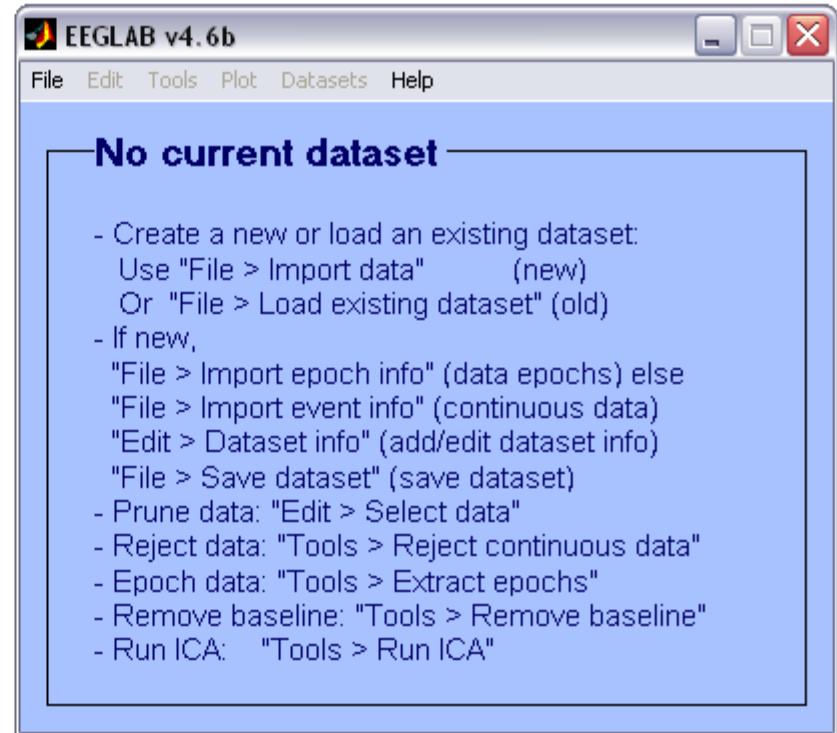


>> help pop

EEGLAB Plugins/Extensions

Starting EEGLAB

```
>> eeglab
eeglab: options file is /Volumes/donnees/data/STUDYste
Adding path to all EEGLAB functions
Adding path to eeglab/external/bioelectromagnetism_lig
Adding path to eeglab/external/biosig-partial
Adding path to eeglab/external/fieldtrip-partial
Adding path to eeglab/external/fieldtrip-partial subfolders
EEGLAB: adding plugin function "eegplugin_VisEd"
EEGLAB: adding "eepimport1.02" plugin (see >> help ee
EEGLAB: adding "bdfimport" plugin (see >> help eegplu
EEGLAB: adding "brainmovie0.1b" plugin (see >> help ee
EEGLAB: adding "ctfimport1.03" plugin (see >> help eeg
EEGLAB: adding "dipfit2.2" plugin (see >> help eegplugi
EEGLAB: adding "EEG toolbox ERP plotting" plugin (see >> help eegplugin_eeg_toolbox)
EEGLAB: adding "erpssimport1.00" plugin (see >> help eegplugin_erpssimport)
EEGLAB: adding "fmrib1.21" plugin (see >> help eegplugin_fmrib)
EEGLAB: adding "iirfilt1.01" plugin (see >> help eegplugin_iirfilt)
EEGLAB: adding "eepimport1.02" plugin (see >> help eegplugin_ascinstep)
EEGLAB: adding "loreta1.0" plugin (see >> help eegplugin_loreta)
EEGLAB: adding "Butter1.0" plugin (see >> help eegplugin_ERPLAB_filters)
EEGLAB: adding "Measure_Product1.0" plugin (see >> help eegplugin_mp_clustering)
EEGLAB: adding plugin function "eegplugin_miclust"
EEGLAB: adding "4dneuroimaging1.00" plugin (see >> help eegplugin_4dneuroimaging)
>>
```



EEGLAB plugins

eepimport1.02	Data importing for EEprobe data (Oostenveld & ANT company)
bva_io1.30	Brain vision analyzer import/export plugin (Widmann & Delorme)
ctfimport1.01	MEG CTF import plugin (Carver, Weber & Delorme)
dipfit2.0	4-shell and BEM (Oostenveld & Delorme)
fmrib1.2b	Removal of artifact from simultaneously EEG/fMRI recording (Niazi)
icaclust1.00	Clustering ICA components (Serby, Delorme, Makeig)
iirfilt1.0	Non-linear IIR filtering (Pozdin)
loreta1.0	Interface to LORETA-KEY (Delorme)
newtimefreq1.00	Time-freq. decomposition (Delorme)

**Better than FIR
Coregistration...**

Matlab toolboxes interfaced

BIOSIG	Data importing for rare data binary format (Schloegl)
Fieldtrip	Source localization and time-freq. decompositions (Oostenveld)
ICALAB	20 ICA algorithms (automatically detected by EEGLAB)
SPM2	Spatial normalization of anatomical MRI

Plugin list process – SCCN

sccn.ucsd.edu/wiki/Plugin_list_process

page discussion view source history

92.149.236.22 talk for this ip address log in

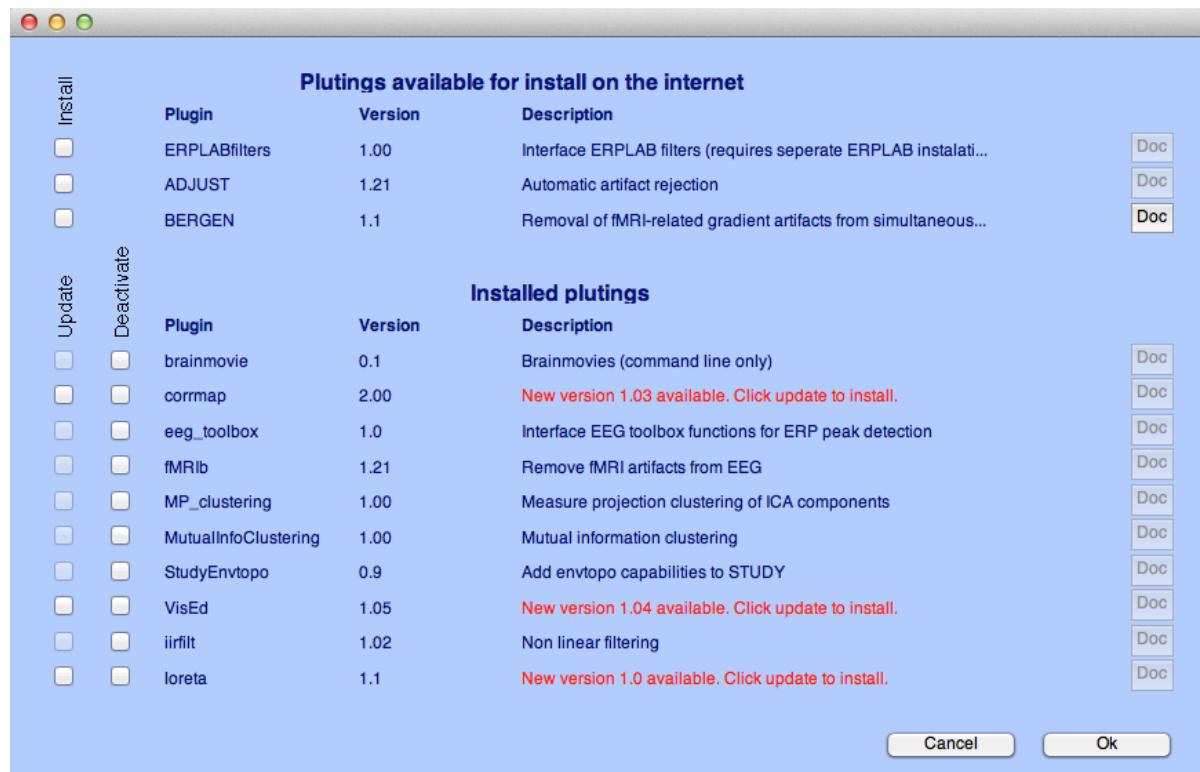
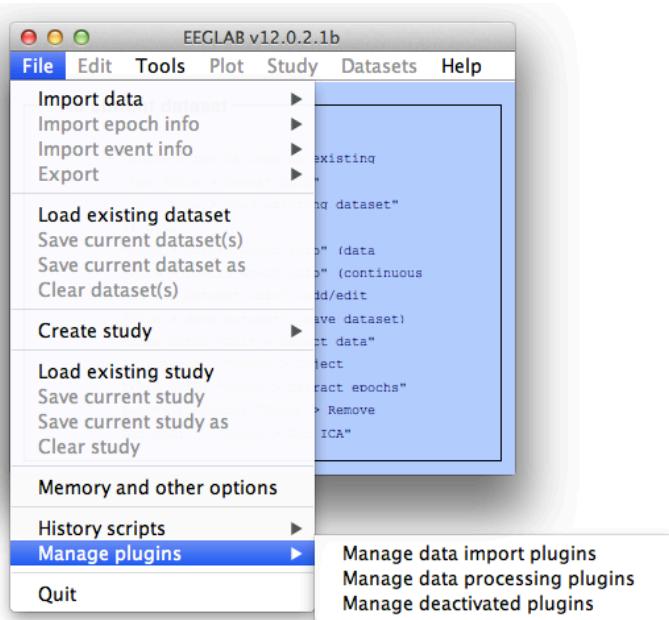
Plugin list process

Plugin name	Version	Short plugin description	Link	Comments
brainmovie	0.1	Brainmovies (command line only)	Download	User comments
corrmap	1.03	Import BIOPAC data files	Download	User comments
eeg_toolbox	1.0	Interface EEG toolbox functions for ERP peak detection	Download	User comments
ERPLABfilters	1.00	Interface ERPLAB filters (requires separate ERPLAB installation)	Download	User comments
fMRIb	1.21	Remove fMRI artifacts from EEG	Download	User comments
MP_clustering	1.00	Measure projection clustering of ICA components	Download	User comments
MutualInfoClustering	1.00	Mutual information clustering	Download	User comments
StudyEnvtopo	0.9	Add envtopo capabilities to STUDY	Download	User comments
VisEd	1.04	Add/Edit dataset events	Download	User comments
ADJUST	1.21	Automatic artifact rejection	Download	User comments
iirfilt	1.02	Non linear filtering	Download	User comments
loreta	1.0	Export and import data to/from LORETA software	Download	User comments
BERGEN	1.1	Removal of fMRI-related gradient artifacts from simultaneous EEG-fMRI data	Download	User comments

Add your plugin to the list

You may add your plugin to the list so users can download it automatically from within EEGLAB. There are 5 tabs:

- **Plugin name:** this tab should contain the abbreviated name of your plugin and if necessary a link to the plugin documentation. The plugin documentation may be stored on this wiki.
- **Version:** this tab should contain the version of your plugin. The version listed on this page and the one made available in the eegplugin_xxx.m file must be consistent. This allows EEGLAB to automatically check for newer versions of your plugin.
- **Short plugin description:** this tab should contain a short plugin description (no more than one line). Additional documentation may be provided as a link in tab 1.



Writing EEGLAB plugins

Assuming that you have a signal processing function called `xxxxx`



Process any
Input data

`newtimef()`

a `pop_xxxxx` function will interface your signal processing function



Process EEG
structure

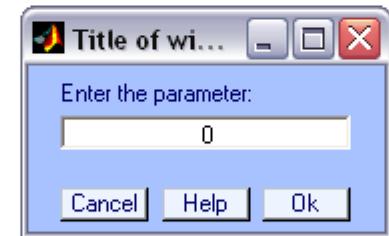
`Pop_newtimef()`

a `eegplugin_xxxxx` function will add the menu to the main interface (and history etc...)

Pop functions

- Called with the EEG structure only `pop_xxxxx(EEG)`, they pop-up a GUI asking for more arguments
- Called with enough arguments, they simply call the signal processing function

```
function [EEG, com] = pop_sample( EEG, param1 );  
  
com = ""; % empty history  
if nargin < 2  
    % pop up window if less than 2 arguments  
    result = inputdlg({ 'Enter the parameter:' }, 'Title of window', 1, { '0' })  
    if length( result ) == 0 return; end;  
  
    param1 = eval( [ '[' result{1} ']' ] ); % the brackets allow to process matlab arrays  
end;  
  
sample( EEG.data, param1); % run sample function  
  
com = sprintf('pop_sample(EEG, %d );', param1); % return history
```



eegplugin functions

- eegplugin_xxxx function

```
% eegplugin_erp() - plot ERP plugin

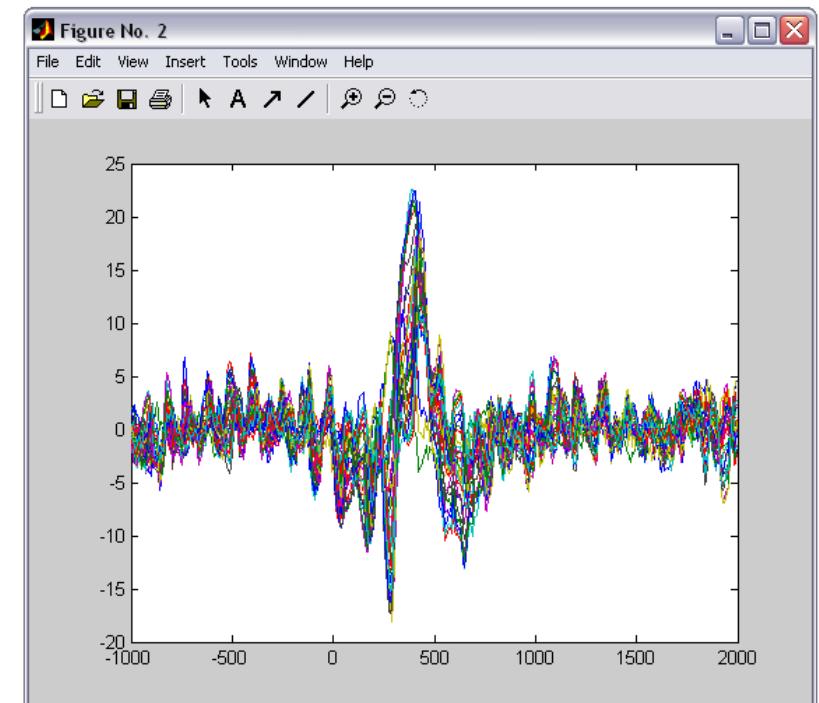
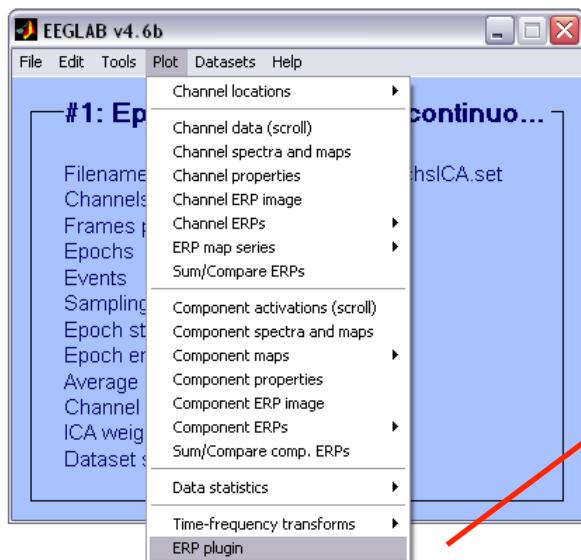
function eegplugin_erp( fig, try_strings, catch_strings);

% create menu
plotmenu = findobj(fig, 'tag', 'plot'); % find plot menu

% create submenu
uimenu( plotmenu, 'label', 'ERP plugin', ...
    'callback', 'figure; plot(EEG.times, mean(EEG.data,3));');
```

eegplugin functions

```
>> eeglab
eeglab: adding "BIOSIGv0.86" plugin
eeglab: adding "eepimport1.02" plugin (see >> help eegplugin_eepimport)
eeglab: adding "bva_io1.30" plugin (see >> help eegplugin_bva_io)
eeglab: adding "ctfimport1.01" plugin (see >> help eegplugin_ctfimport)
eeglab: adding "dipfit2.0" plugin (see >> help eegplugin_dipfit2_0)
eeglab: adding plugin function "eegplugin_erp"
eeglab: adding "fmrib1.2b" plugin (see >> help eegplugin_fmrib)
eeglab: adding "icaclust1.00" plugin (see >> help eegplugin_icaclust)
eeglab: adding "iirfilt1.0" plugin (see >> help eegplugin_iirfilt)
eeglab: adding "loreta1.0" plugin (see >> help eegplugin_loreta)
eeglab: adding "newtimefreq1.00" plugin (see >> help eegplugin_ne
>>
```



PCA plugin

```
function vers = eegplugin_pca(fig, trystrs, catchstrs)

    vers = 'pca1.00';
    if nargin < 3, error('eegplugin_pca requires 3 arguments'); end;

    % add icaclust folder to path
    if ~exist('eegplugin_pca')
        p = which('eegplugin_pca');
        p = p(1:findstr(p,'eegplugin_pca.m')-1);
        addpath( p );
    end;

    % find tools menu
    menu = findobj(fig, 'tag', 'tools');

    % PCA command
    cmd = [ 'tmp1 EEG.icawinv' = runpca(EEG.data(:, :)); ' ];
    cmd = [ cmd 'EEG.icaweights = pinv(EEG.icawinv);' ];
    cmd = [ cmd 'EEG.icasphere = eye(EEG.nbchan);' ];
    cmd = [ cmd 'clear tmp1;' ];

    % create menu
    uimenu( menu, 'Label', 'Run PCA', 'CallBack', cmd, 'separator', 'on');

    % import data' -> File > import data menu
    % import epoch' -> File > import epoch menu
    % import event' -> File > import event menu
    % export' -> File > export
    % tools' -> tools menu
    % plot' -> plot menu
```

Exercice

Write a plugin to plot ERPs