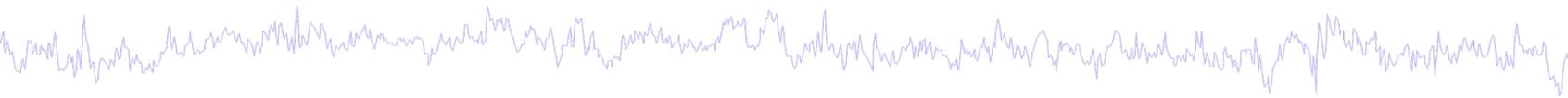
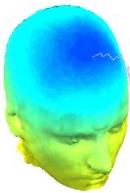


STUDY design and plotting overview



STEP 1

Build a STUDY

STEP 2

Build design(s)

STEP 3

Precompute the data

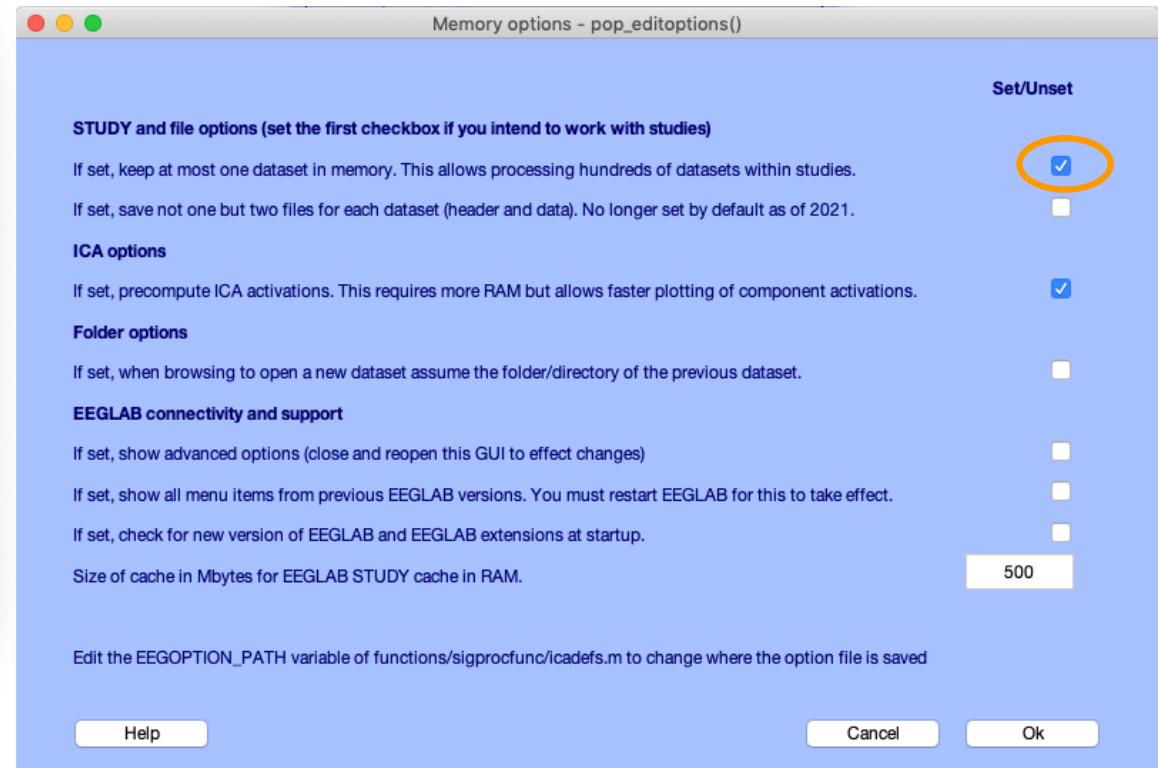
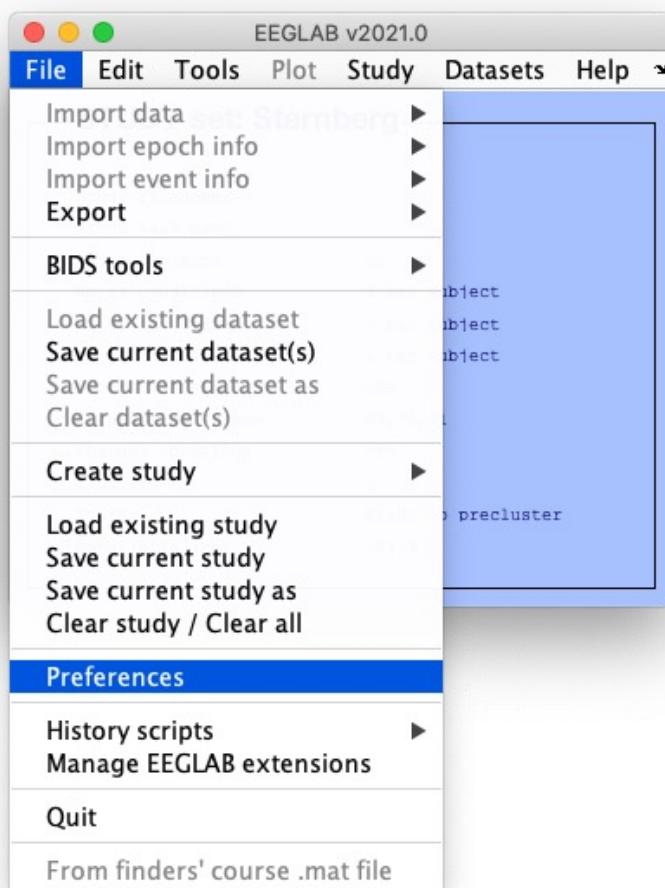
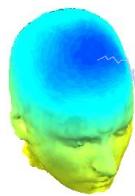
STEP 4

Plot the data

Exercise...

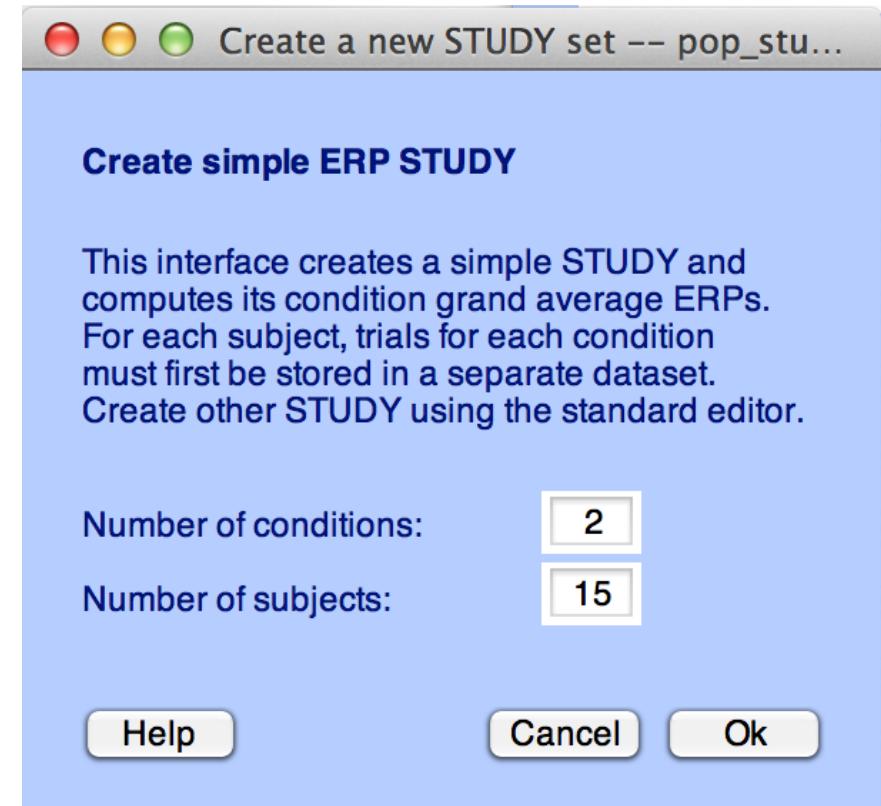
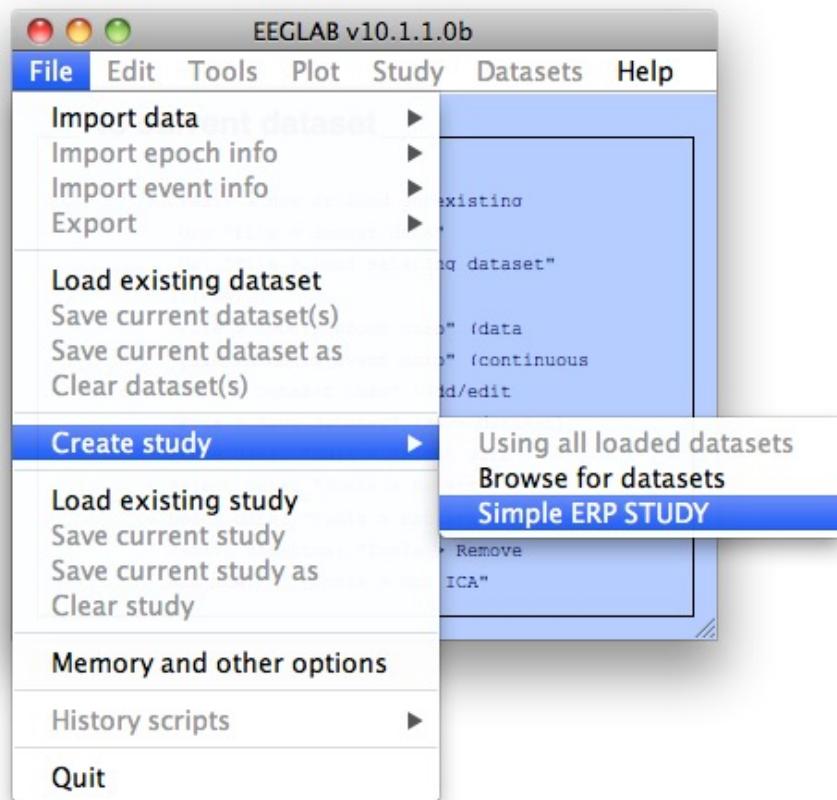
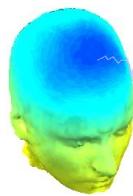


Memory options



**Memory options should change
when using STUDY vs single dataset**

Create simple ERP STUDY



Create a new STUDY set -- pop_studyerp()

Create simple ERP STUDY

STUDY set name:

Condition 1 name

Condition 2 name

Condition 1 datasets

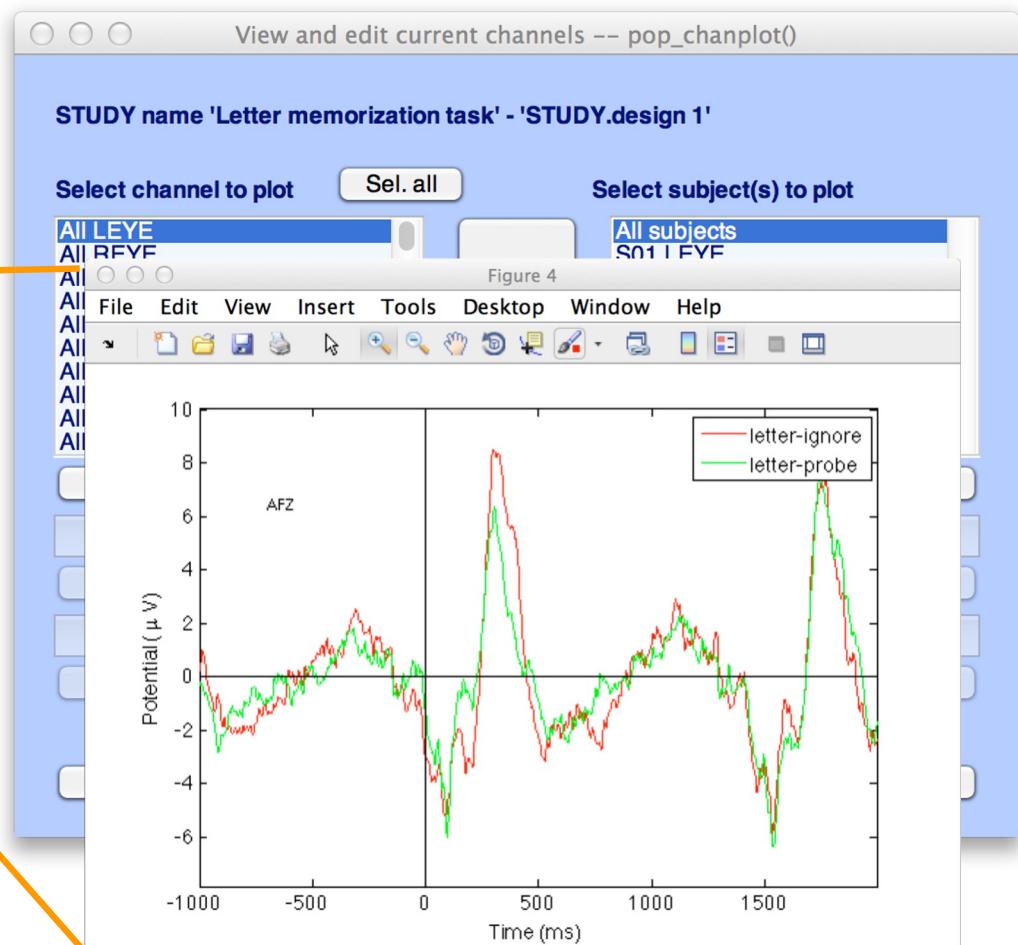
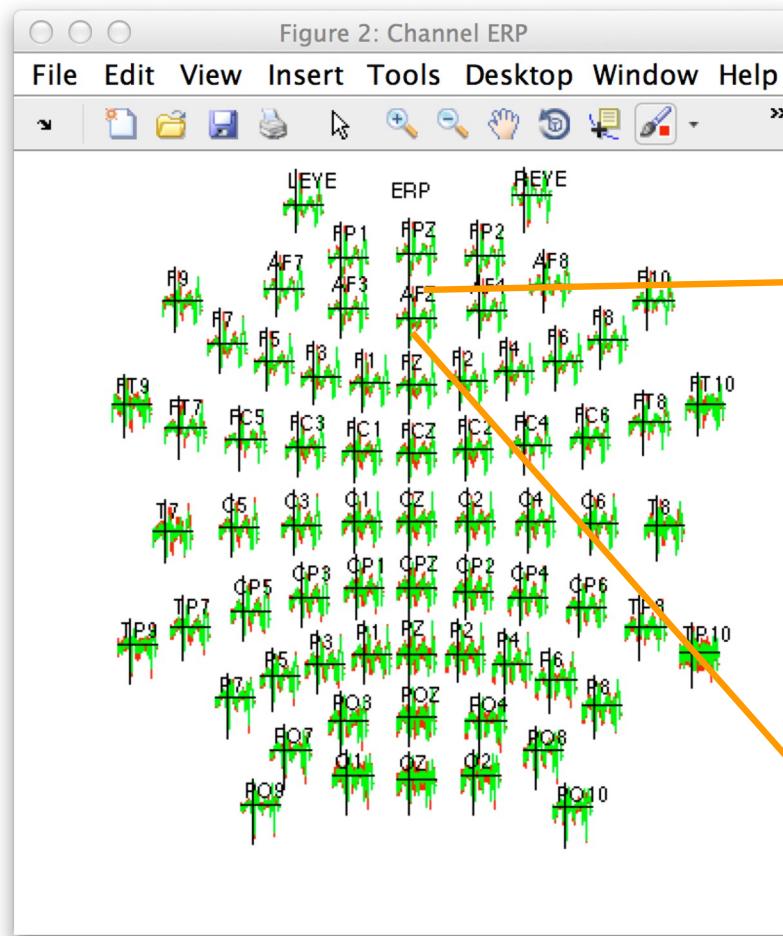
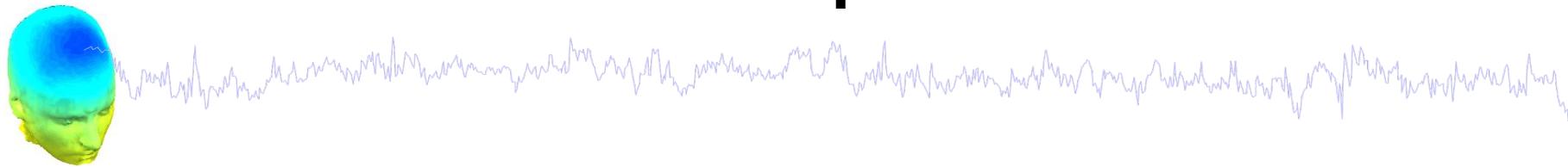
<input type="text" value="/data/STUDY/S01/Ignore.set"/>	...
<input type="text" value="/data/STUDY/S02/Ignore.set"/>	...
<input type="text" value="/data/STUDY/S03/Ignore.set"/>	...
<input type="text"/>	...

Condition 2 datasets

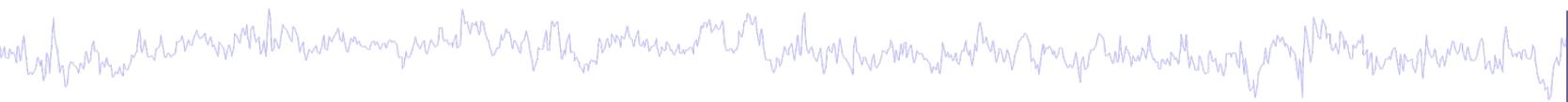
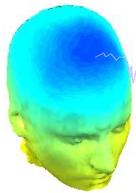
<input type="text" value="/data/STUDY/S01/Memorize.set"/>	...
<input type="text" value="/data/STUDY/S02/Memorize.set"/>	...
<input type="text" value="/data/STUDY/S03/Memorize.set"/>	...
<input type="text"/>	...

When using more than 1 condition, datasets on each line must correspond to the same subject.

Create simple ERP STUDY



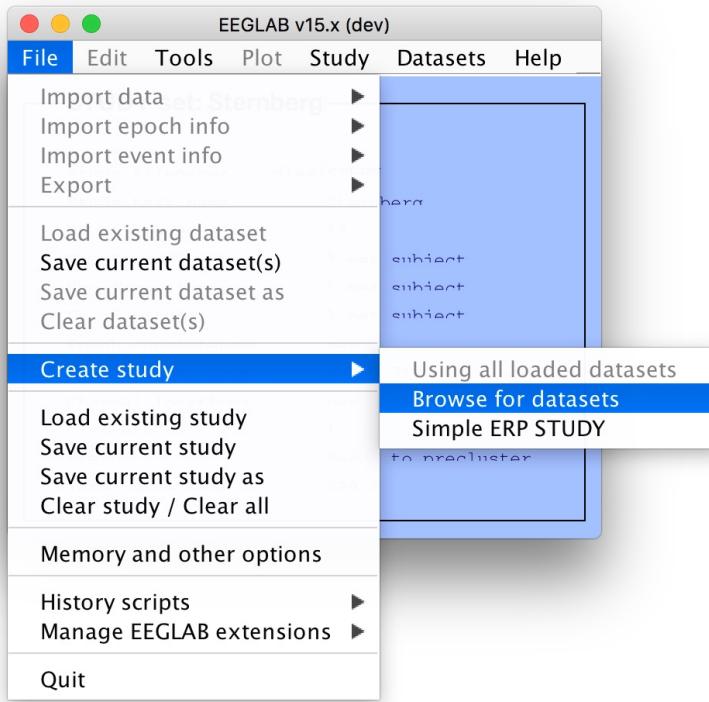
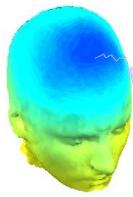
Exercises



Suggestion for exercise

1. From the GUI, select “File > Create STUDY > Simple ERP STUDY”
2. Enter 2 conditions “letter-ignore” and “letter-memorize”
3. In the column for “letter-ignore” select datasets “ignore.set” for 3 subjects S01, S02, S03 (in the STERN folder)
4. In the column for “letter-memorize” select datasets “memorize.set” for 3 subjects S01, S02, S03 (in the STERN folder)
5. Press OK.





Create a new STUDY set -- pop_study()

Edit STUDY set information - remember to save changes

STUDY set name: Sternberg

STUDY set task name: Sternberg

STUDY set notes:

dataset filename	browse	subject	session	condition	group
1 /data/oral/EEGLAB/ASPET_2017/L	...	S01	1	memorize	1
2 /data/oral/EEGLAB/ASPET_2017/L	...	S01	1	ignore	1
3 /data/oral/EEGLAB/ASPET_2017/L	...	S01	1	probe	1
4 /data/oral/EEGLAB/ASPET_2017/L	...	S02	1	memorize	1
5 /data/oral/EEGLAB/ASPET_2017/L	...	S02	1	ignore	1
6 /data/oral/EEGLAB/ASPET_2017/L	...	S02	1	probe	1
7 /data/oral/EEGLAB/ASPET_2017/L	...	S03	1	memorize	1
8 /data/oral/EEGLAB/ASPET_2017/L	...	S03	1	ignore	1
9 /data/oral/EEGLAB/ASPET_2017/L	...	S03	1	probe	1
10 /data/oral/EEGLAB/ASPET_2017/L	...	S04	1	memorize	1

Select by r.v.

Comp.: 3 5 ... Clear
Comp.: 3 5 ... Clear
Comp.: 3 5 ... Clear
Comp.: 5 6 ... Clear
Comp.: 5 6 ... Clear
Comp.: 6 8 ... Clear
Comp.: 6 8 ... Clear
Comp.: 1 2 ... Clear

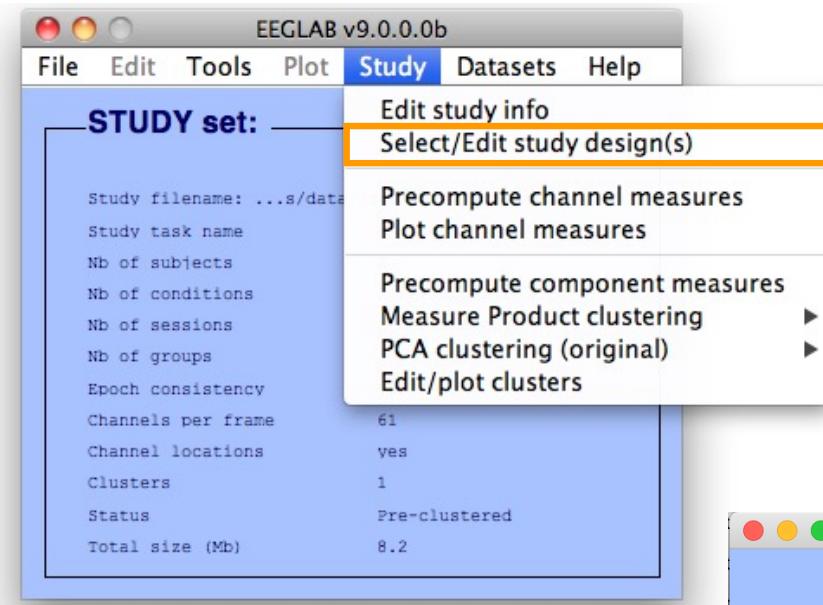
Important note: Removed datasets will not be saved before being deleted from EEGLAB memory

< > Page 1

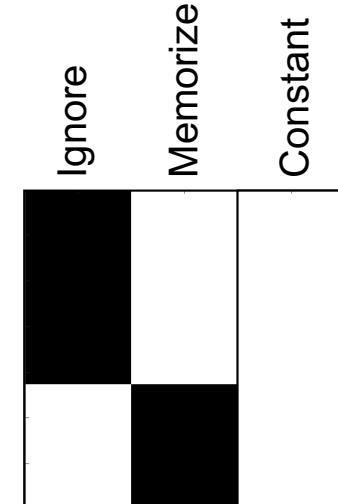
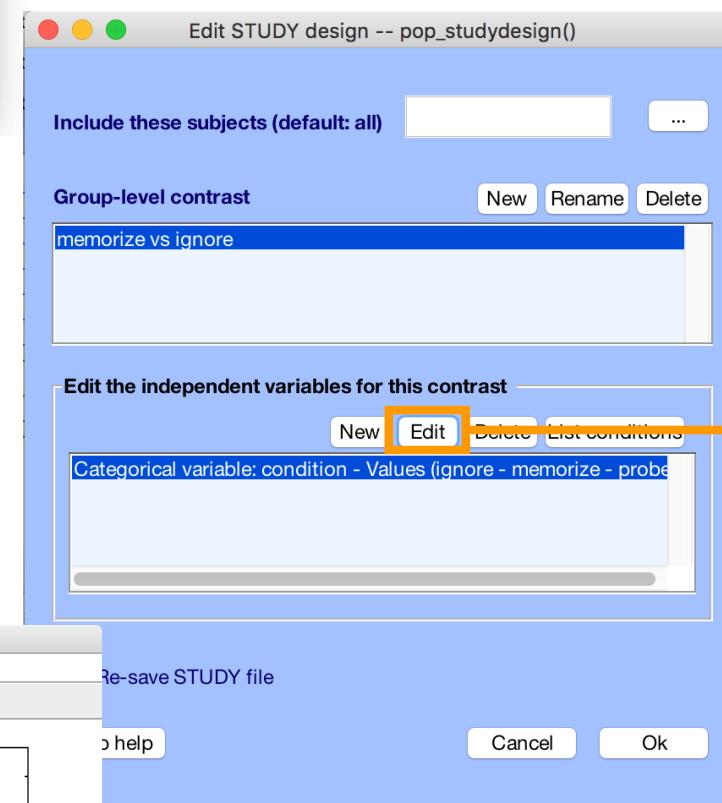
Dataset info (condition, group, ...) differs from study info. [set] = Overwrite dataset info for each dataset on disk.

Delete cluster information (to allow loading new datasets, set new components for clustering, etc.)

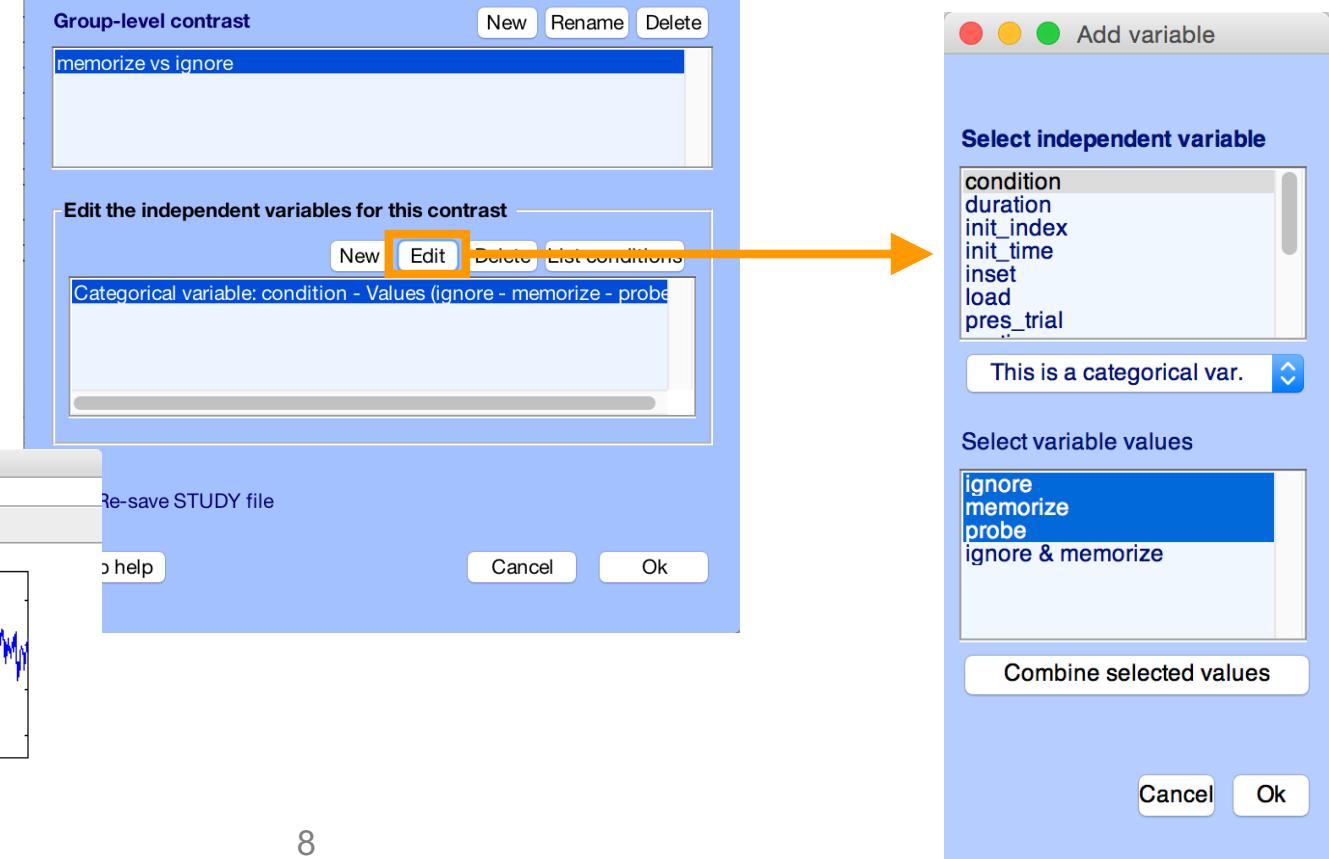
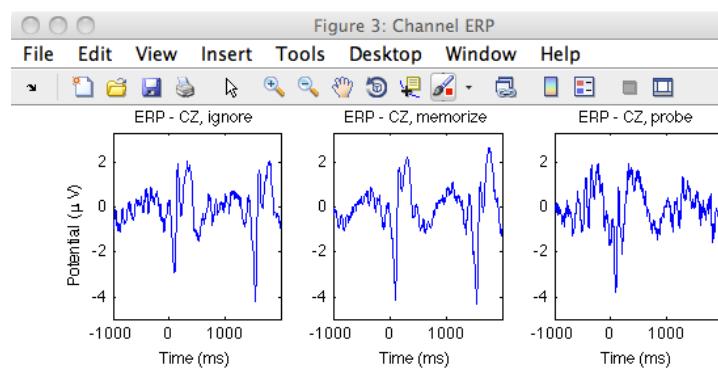
Help Cancel Ok



Create design



1x3 design



EEGLAB v7.1.7.18b

Edit event values -- pop_editeventvals()

File Edit Tools Plot Study Datasets Help

- Dataset info
- Event fields
- Event values**
- About this dataset
- Channel locations
- Select data
- Select data using events
- Select epochs or events
- Copy current dataset
- Append datasets
- Delete dataset(s)
- ICA weights
- Dataset size (Mb)

Number of event fields is unlimited

Trial	1
Event_Type	Picture
Type	nonWM
Latency (sec)	3.112
Time	0
Uncertainty	2
Duration	50283
Uncertainty2	3
ReqTime	0
ReqDur	50000
Init_index	1
Init_time	0.0227
Duration (sec)	0
Load	

Event Num: 1

Insert event << < > >> Append event

Re-order events (for review only)

Main sorting field: No field selected Click for decreasing order

Secondary sorting field: No field selected Click for decreasing order

Re-sort Cancel Help Ok

Create a new STUDY set -- pop_study()

Edit STUDY set information - remember to save changes

STUDY set name: Sternberg

STUDY set task name: Sternberg

STUDY set notes:

	dataset filename	browse	subject	session	condition	group	Select by r.v.
1	C:\Users\julie\Documents\Wor...	...	S01		memorize		Comp.: 3 5 ... Clear
2	C:\Users\julie\Documents\Wor...	...	S01		ignore		Comp.: 3 5 ... Clear
3	C:\Users\julie\Documents\Wor...	...	S01		probe		Comp.: 3 5 ... Clear
4	C:\Users\julie\Documents\Wor...	...	S02		memorize		Comp.: 5 6 ... Clear
5	C:\Users\julie\Documents\Wor...	...	S02		ignore		Comp.: 5 6 ... Clear
6	C:\Users\julie\Documents\Wor...	...	S02		probe		Comp.: 5 6 ... Clear
7	C:\Users\julie\Documents\Wor...	...	S03		memorize		Comp.: 6 7 ... Clear
8	C:\Users\julie\Documents\Wor...	...	S03		ignore		Comp.: 6 7 ... Clear
9	C:\Users\julie\Documents\Wor...	...	S03		probe		Comp.: 6 7 ... Clear
10	C:\Users\julie\Documents\Wor...	...	S04		memorize		Comp.: 1 2 ... Clear

Important note: Removed datasets will not be saved before being deleted from EEGLAB memory

< Page 1 >

Dataset info (condition, group, ...) differs from study info. [set] = Overwrite dataset info.

Delete cluster information (to allow loading new datasets, set new components for clustering, etc.)

Help Cancel Ok

Edit STUDY design -- pop_studiedit()

Add variable

Select STUDY design New Re

Comparing conditions
Memorize-Ignore -- Load
Probe Only -- Load
Design 4
Ignore+Memorize vs Probe
My design

Resave STUDY

This is a categorical var. ▾

Select independent variable

condition duration init_index init_time inset load pres_trial

Edit selected design

Independent variables New Import

Categorical variable: condition - Values (ig)

ignore memorize probe ignore & memorize

Delete all pre-computed datafiles for th

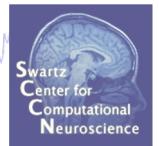
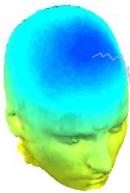
Combine selected values

Web help

Cancel Ok

Design independent of # of files per subject

STUDY design and plotting overview



STEP 1

Build a STUDY

STEP 2

Build design(s)

STEP 3

Precompute the data

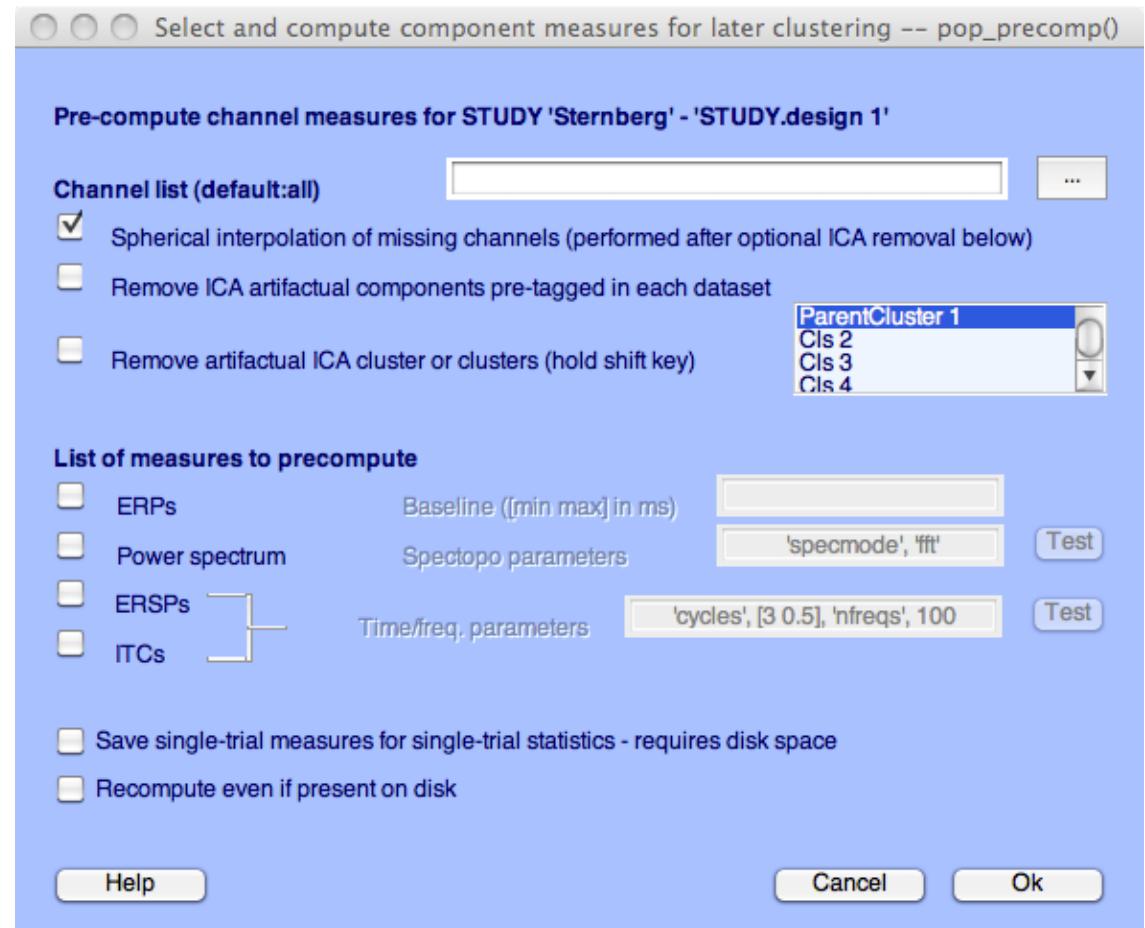
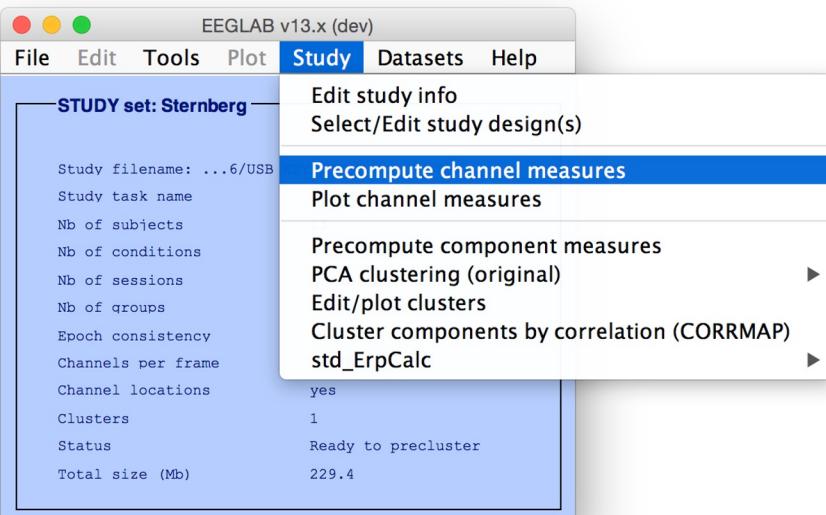
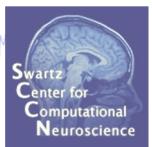
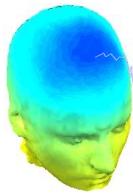
STEP 4

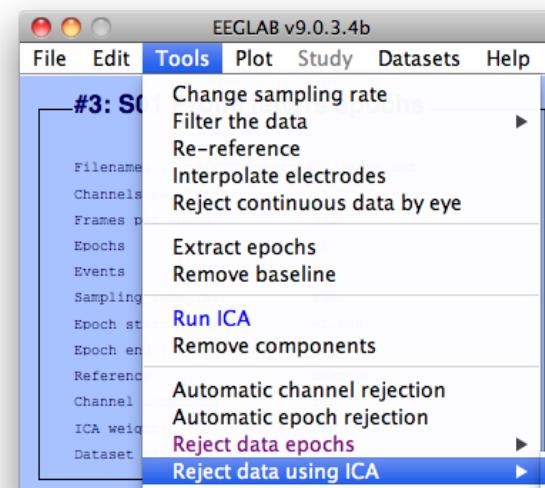
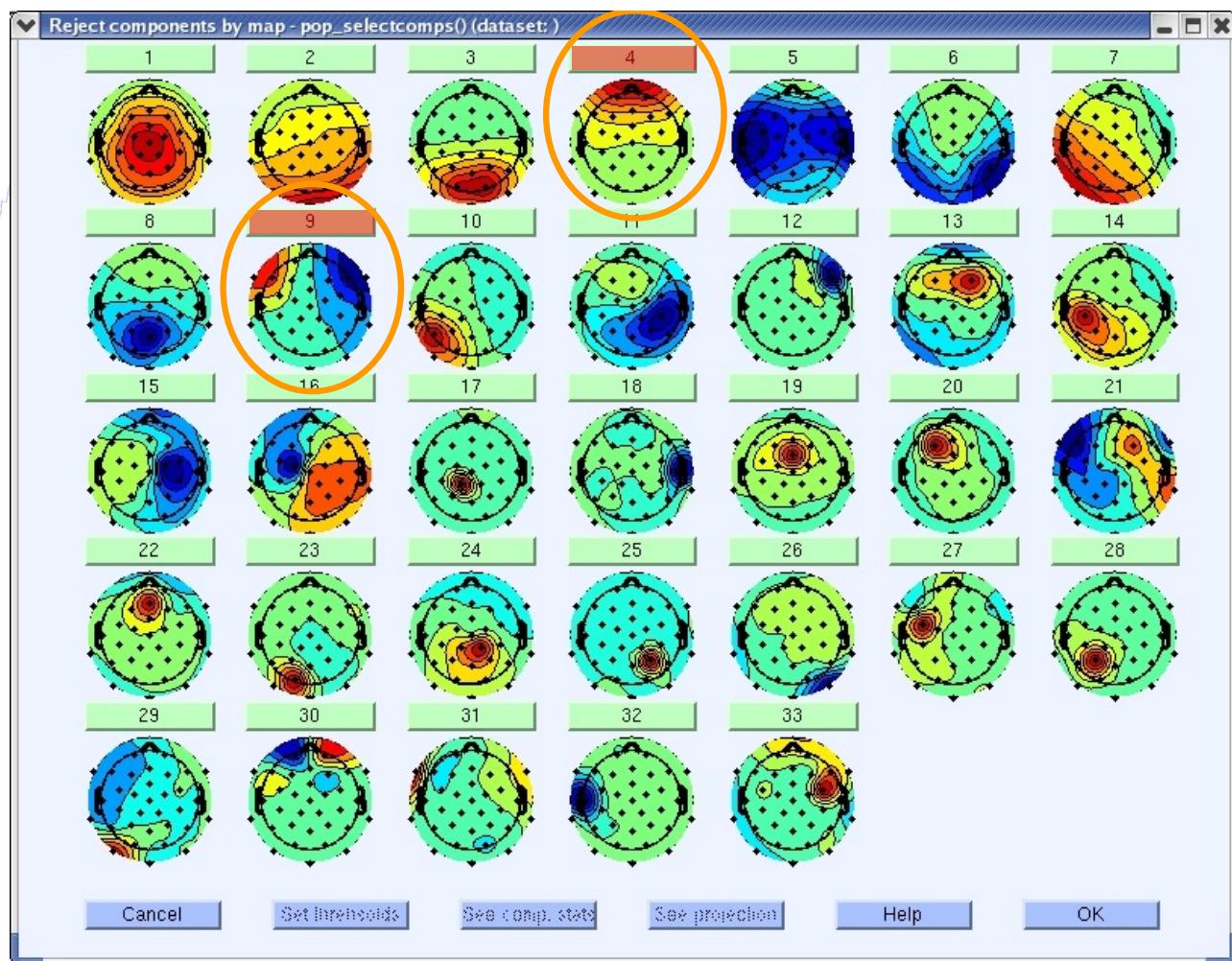
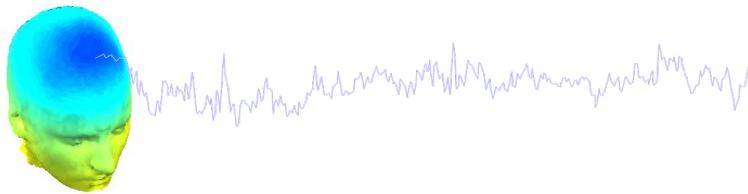
Plot the data

Exercise...

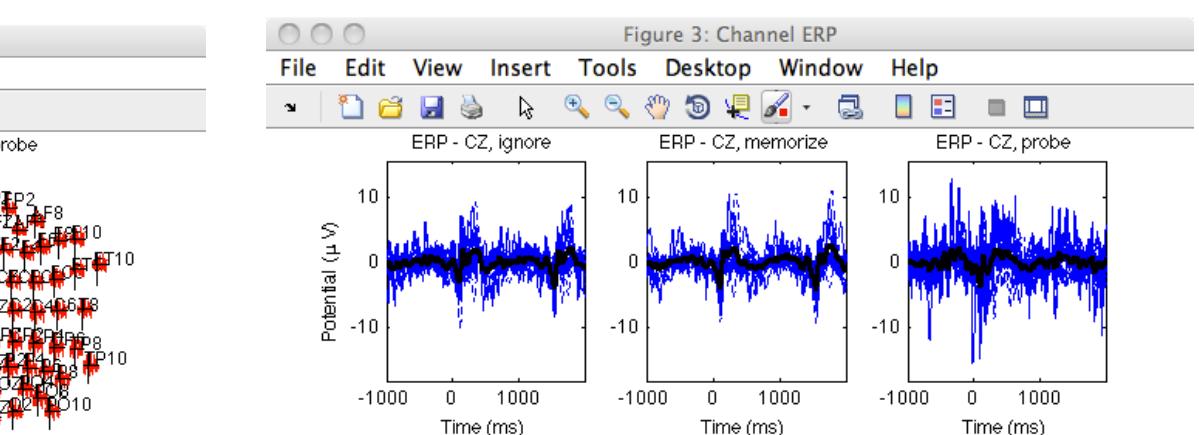
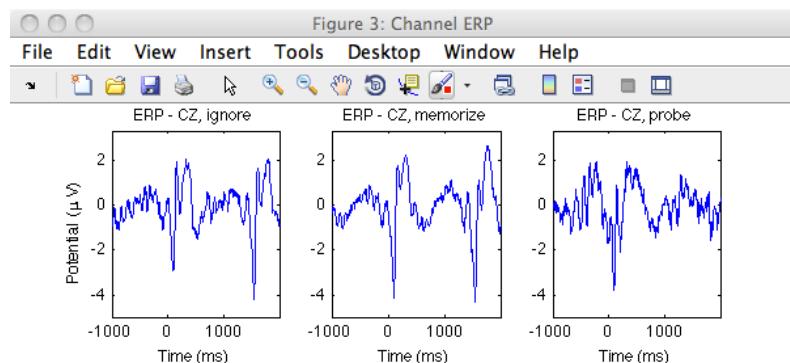
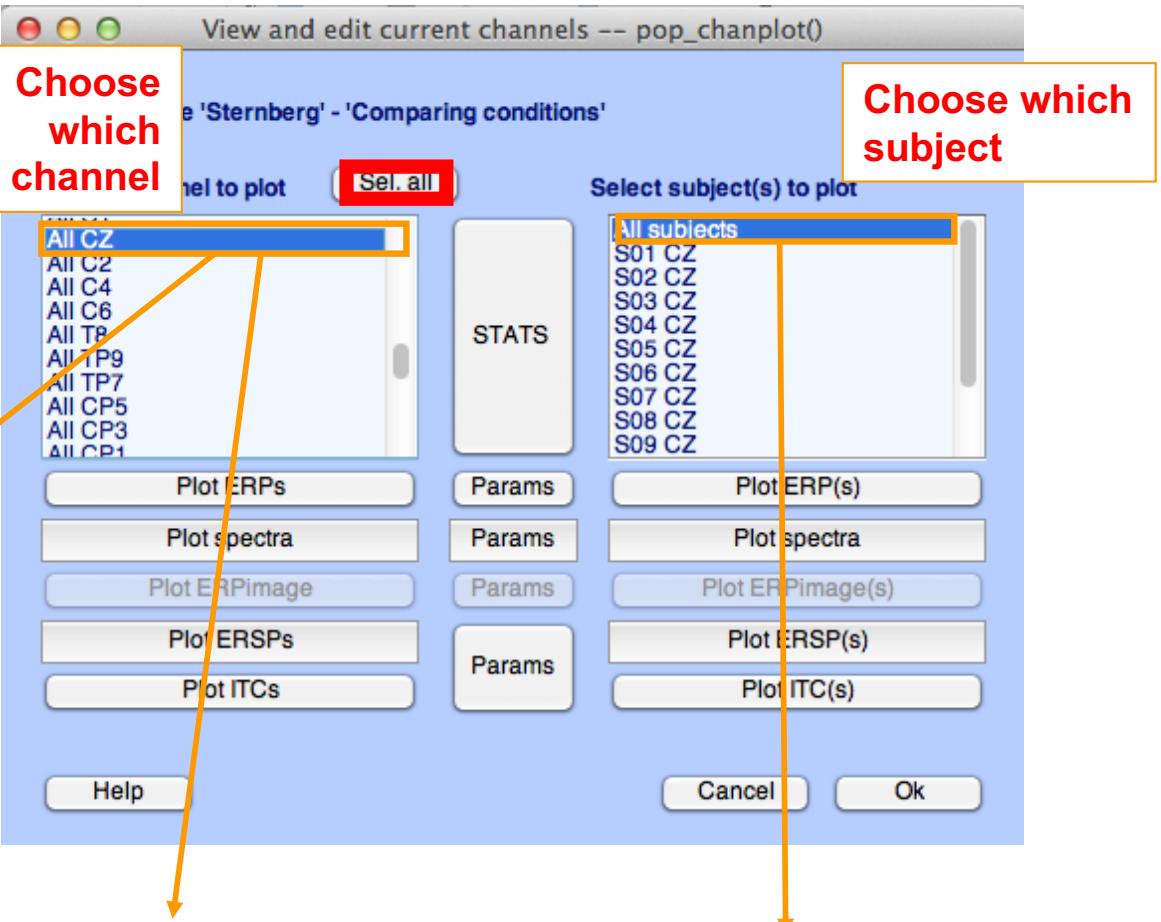
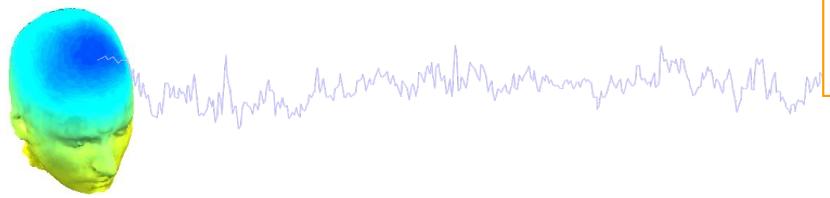


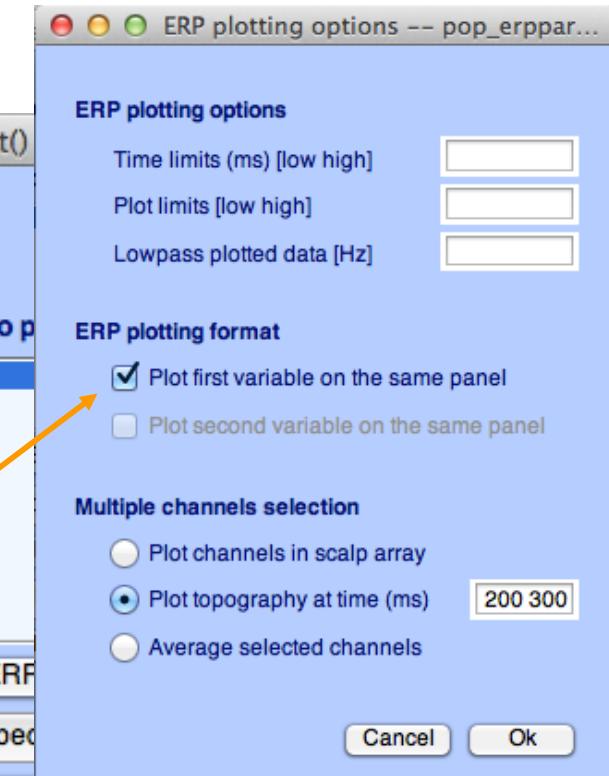
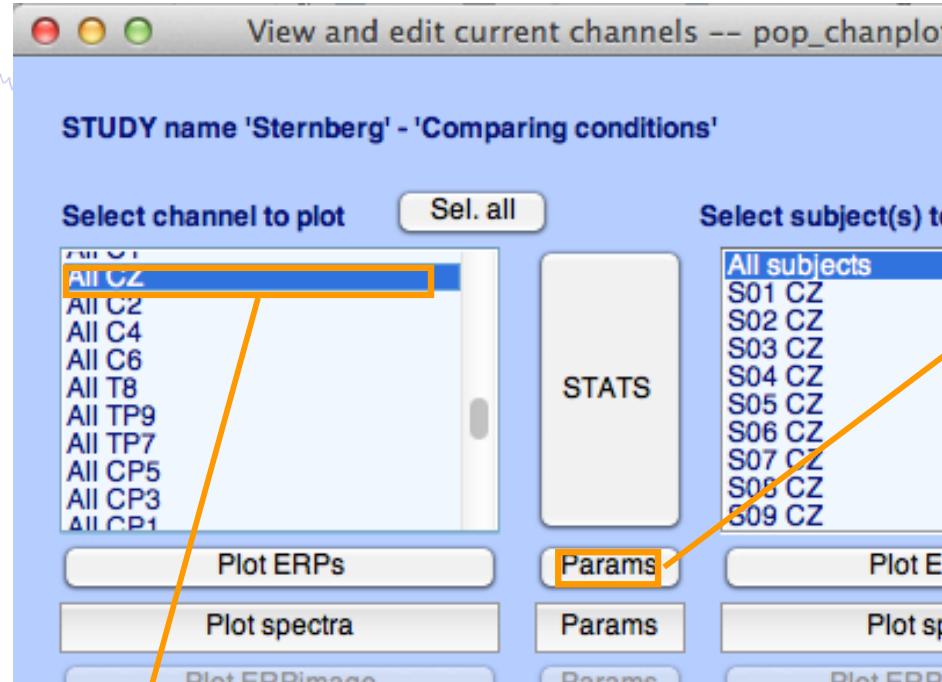
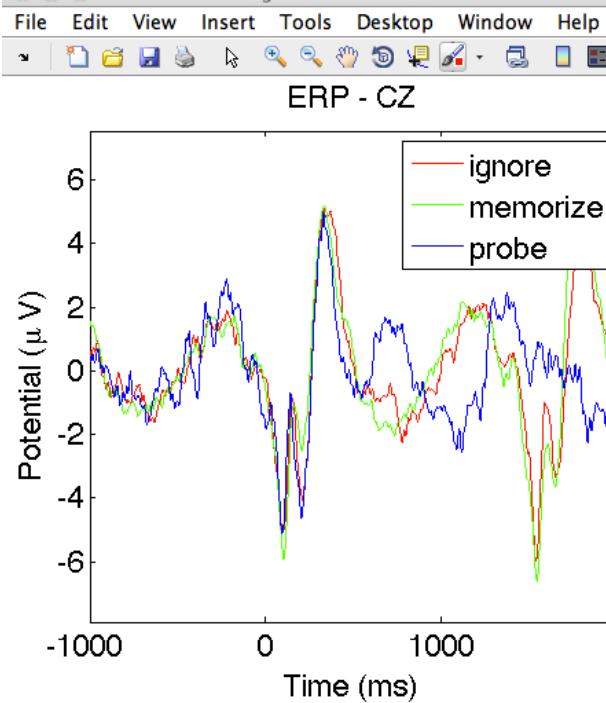
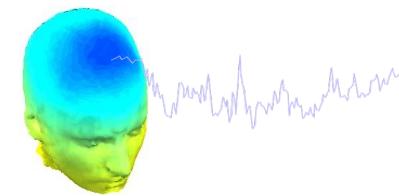
Precompute data measures

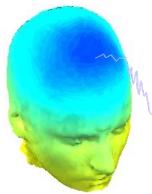




- Reject components by map
- Reject data (all methods)
 - Reject by inspection
 - Reject extreme values
 - Reject by linear trend/variance
 - Reject by probability
 - Reject by kurtosis
 - Reject by spectra
- Export marks to data reject
- Reject marked epochs







View and edit current channels -- pop_chans

STUDY name 'Sternberg' - 'Comparing conditions'

Select channel to plot

All P6
All P8
All PO9
All PO7
All PO3
All POZ
All PO4
All PO8
All PO10
All O1

Select subject(s)

S01 All
S02 All
S03 All
S04 All
S05 All
S06 All
S07 All
S08 All
S09 All

ERP plotting options

Time limits (ms) [low high]

Plot limits [low high]

Lowpass plotted data [Hz]

ERP plotting format

Plot first variable on the same panel
 Plot second variable on the same panel

Multiple channels selection

Plot channels in scalp array
 Plot topography at time (ms) Average selected channels



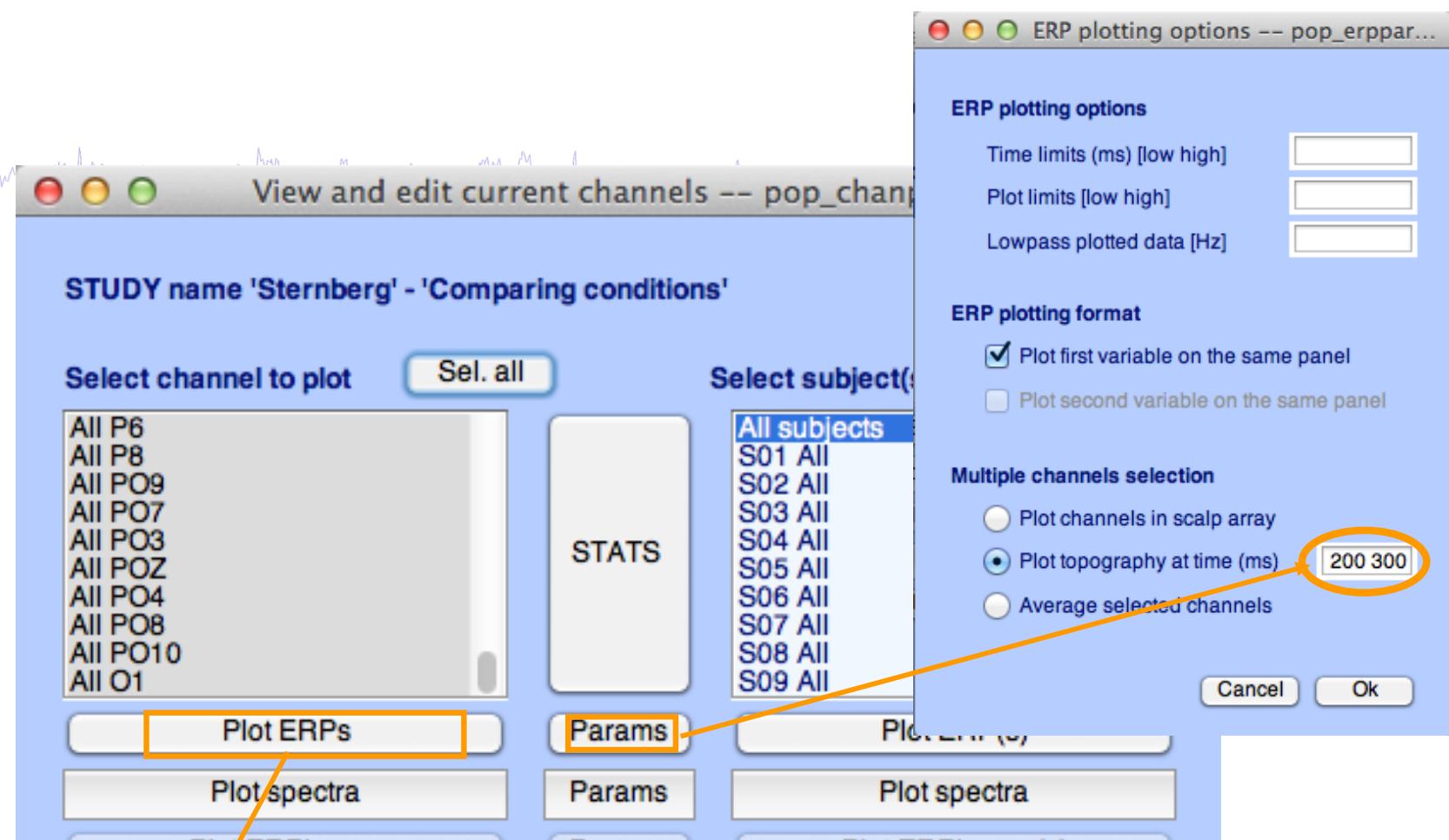
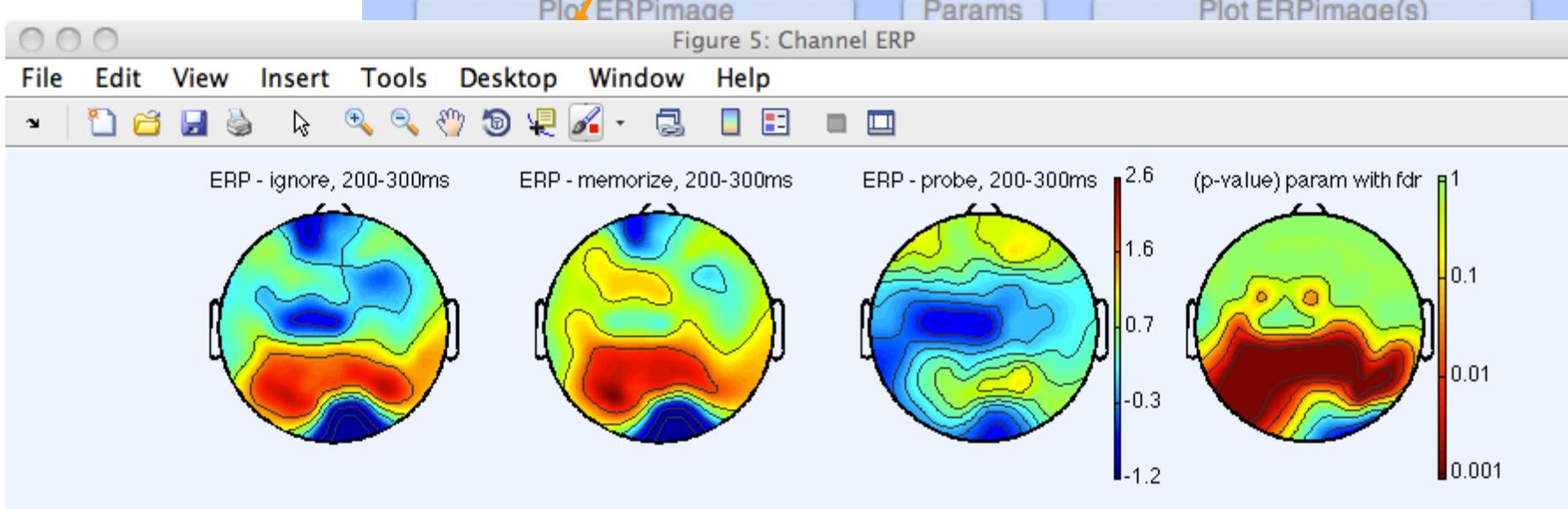
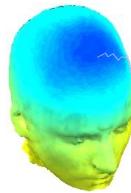


Figure 5: Channel ERP



Computing Spectrum



Select and compute component measures for later clustering -- pop_precomp()

Pre-compute channel measures for STUDY 'Sternberg' - 'STUDY.design 1'

Channel list (default:all) ...

Spherical interpolation of missing channels (performed after optional ICA removal below)

Remove ICA artifactual components pre-tagged in each dataset

Remove artifactual ICA cluster or clusters (hold shift key) **ParentCluster 1**
Cls 2
Cls 3
Cls 4

List of measures to precompute

ERPs Baseline ([min max] in ms) 'specmode', 'fft' **Test**

Power spectrum Spectopo parameters

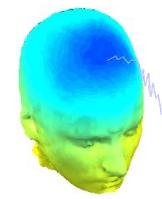
ERSPs  Time/freq. parameters 'cycles', [3 0.5], 'nfreqs', 100 **Test**

ITCs 

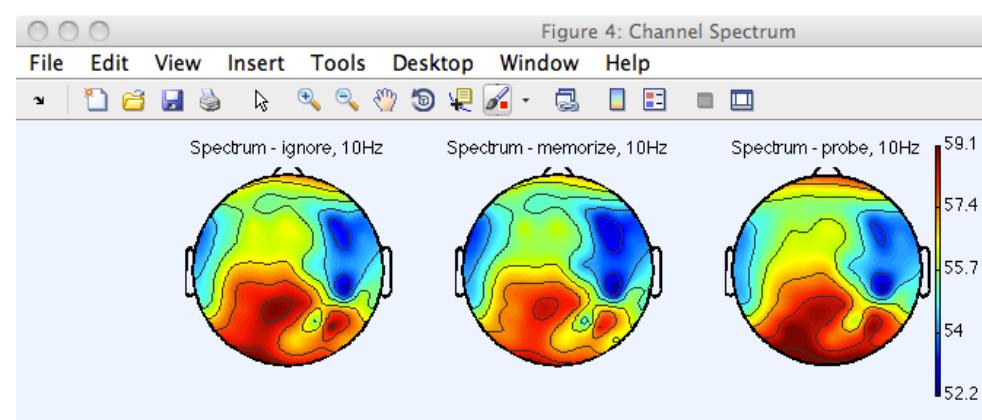
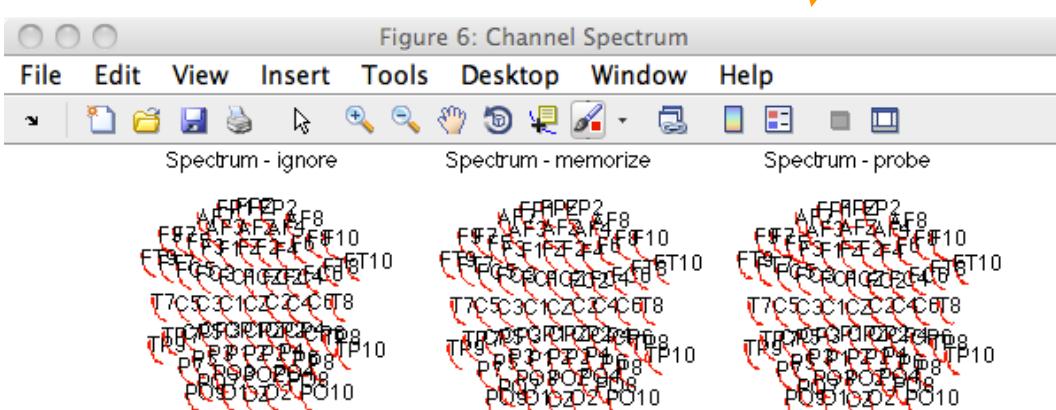
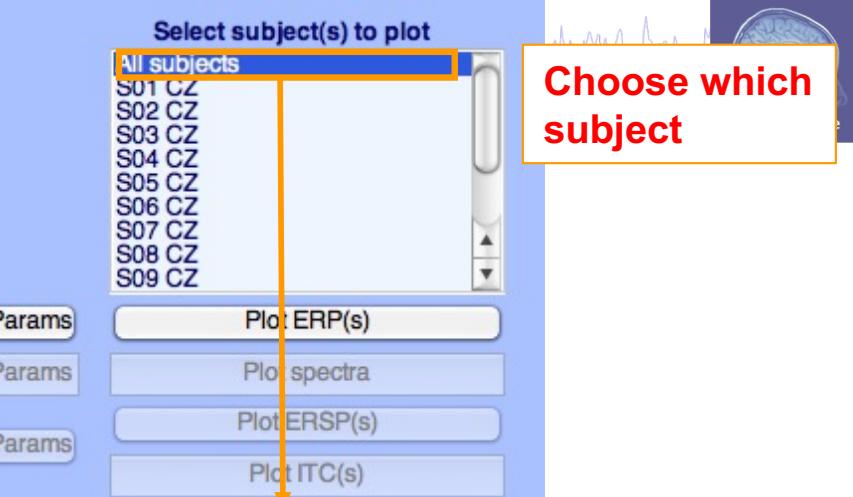
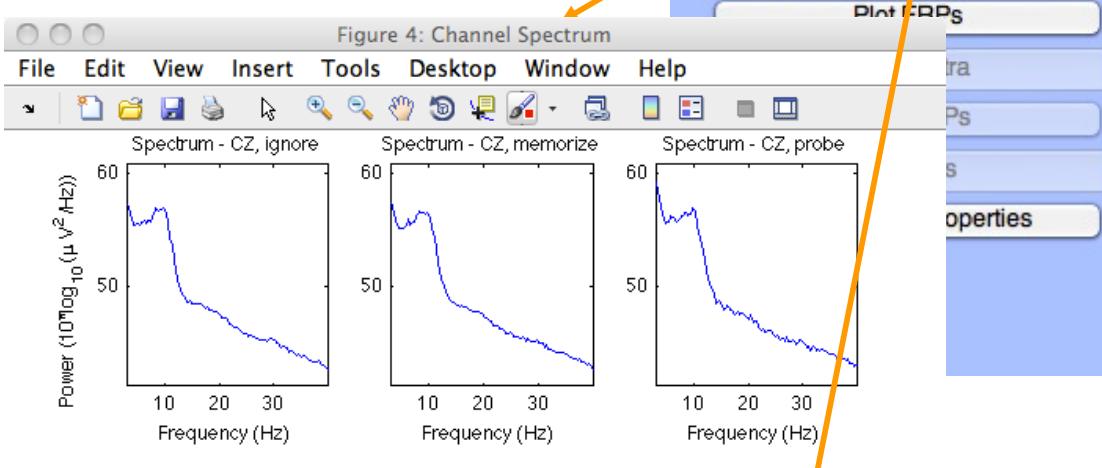
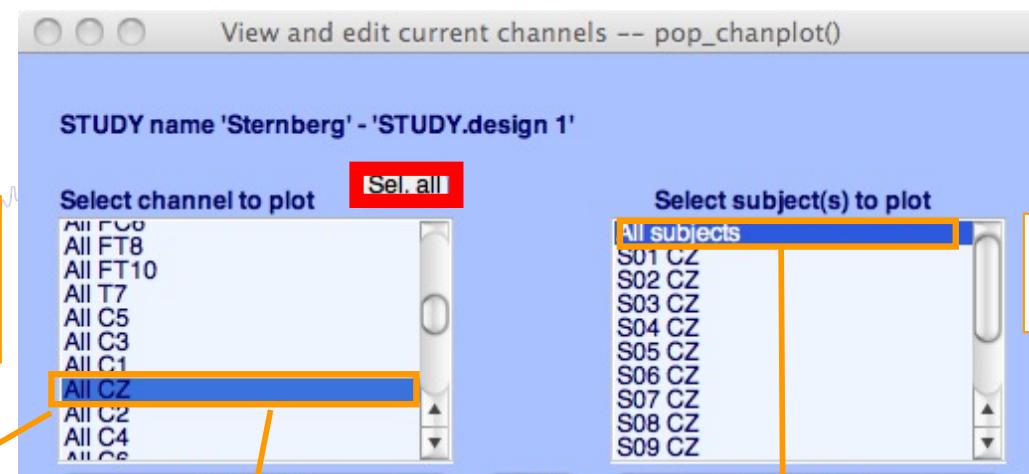
Save single-trial measures for single-trial statistics - requires disk space

Recompute even if present on disk

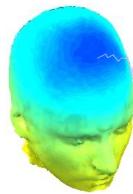
Help **Cancel** **Ok**



Choose
which
channel



Computing ERSP



Select and compute component measures for later clustering -- pop_precomp()

Pre-compute channel measures for STUDY 'Sternberg' - 'Design 2'

Channel list (default:all) ...

Spherical interpolation of missing channels (performed after optional ICA removal below)

Remove ICA artifactual components pre-tagged in each dataset

Remove artifactual ICA cluster or clusters (hold shift key)

ParentCluster 1
Cls 2
Cls 3
Cls 4

List of measures to precompute

ERPs Baseline ([min max] in ms)
 Power spectrum Spectopo parameters 'specmode', 'fft'

ERSPs Time/freq. parameters [3 0.8], 'nfreqs', 50, 'ntimesout', 100

ITCs

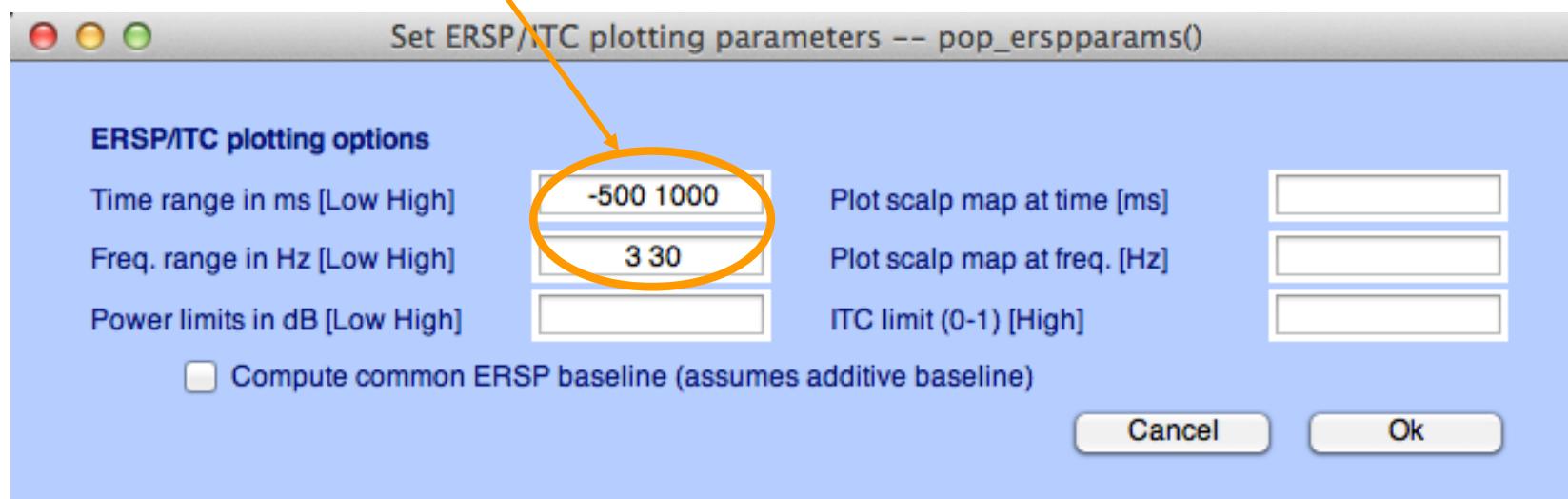
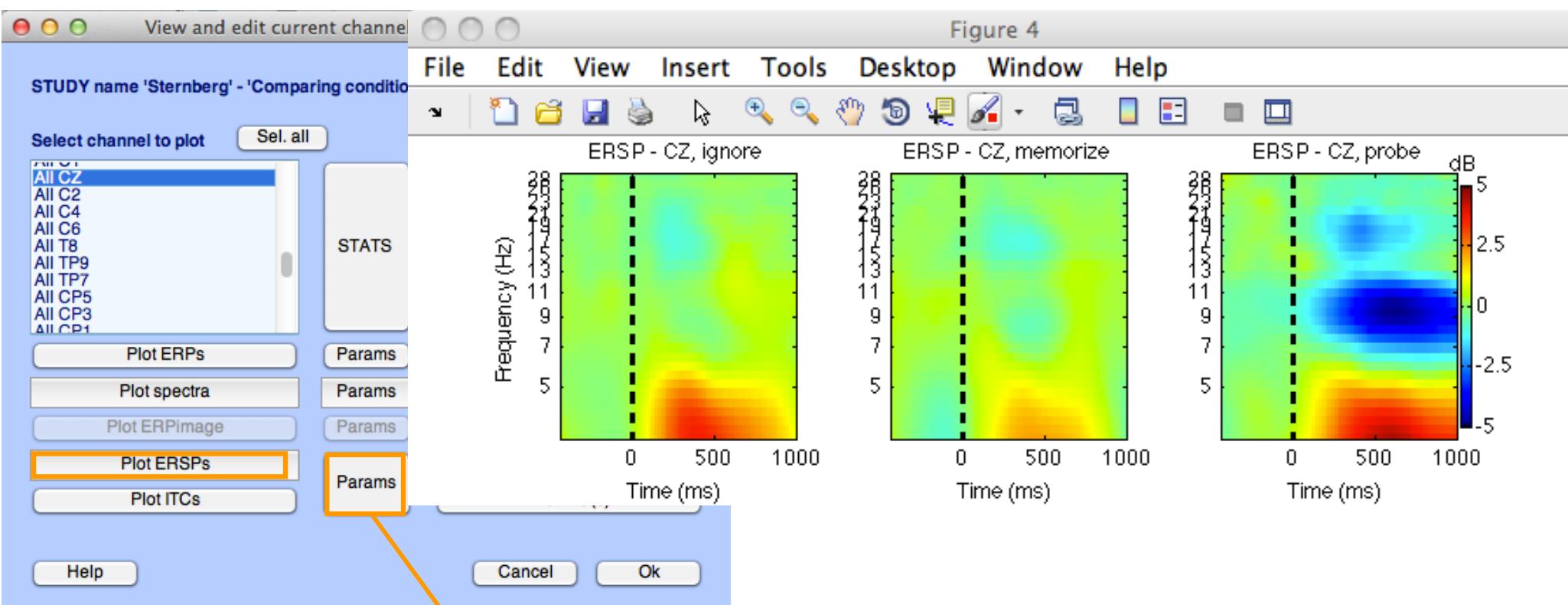
Save single-trial measures for single-trial statistics - requires disk space

Recompute even if present on disk

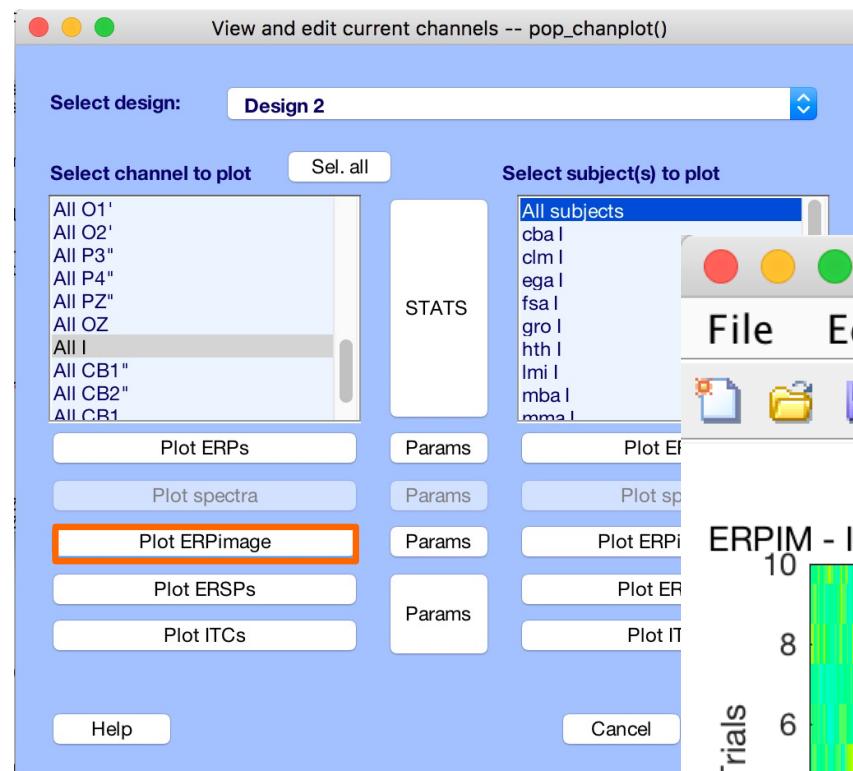
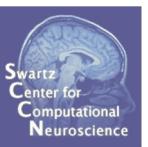
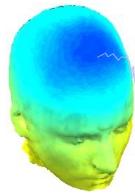
'cycles', [3 0.8], 'nfreqs', 50, 'ntimesout', 100

View and edit current channel

Figure 4

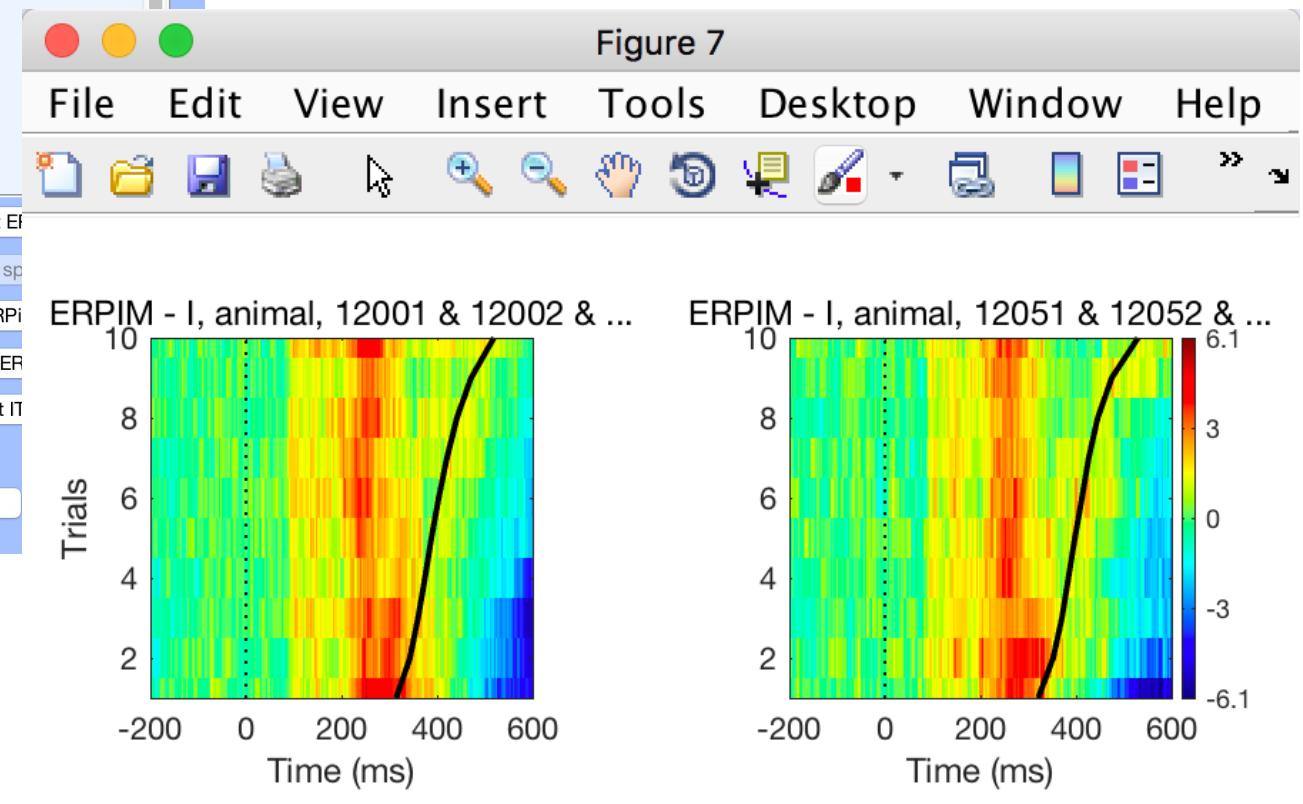


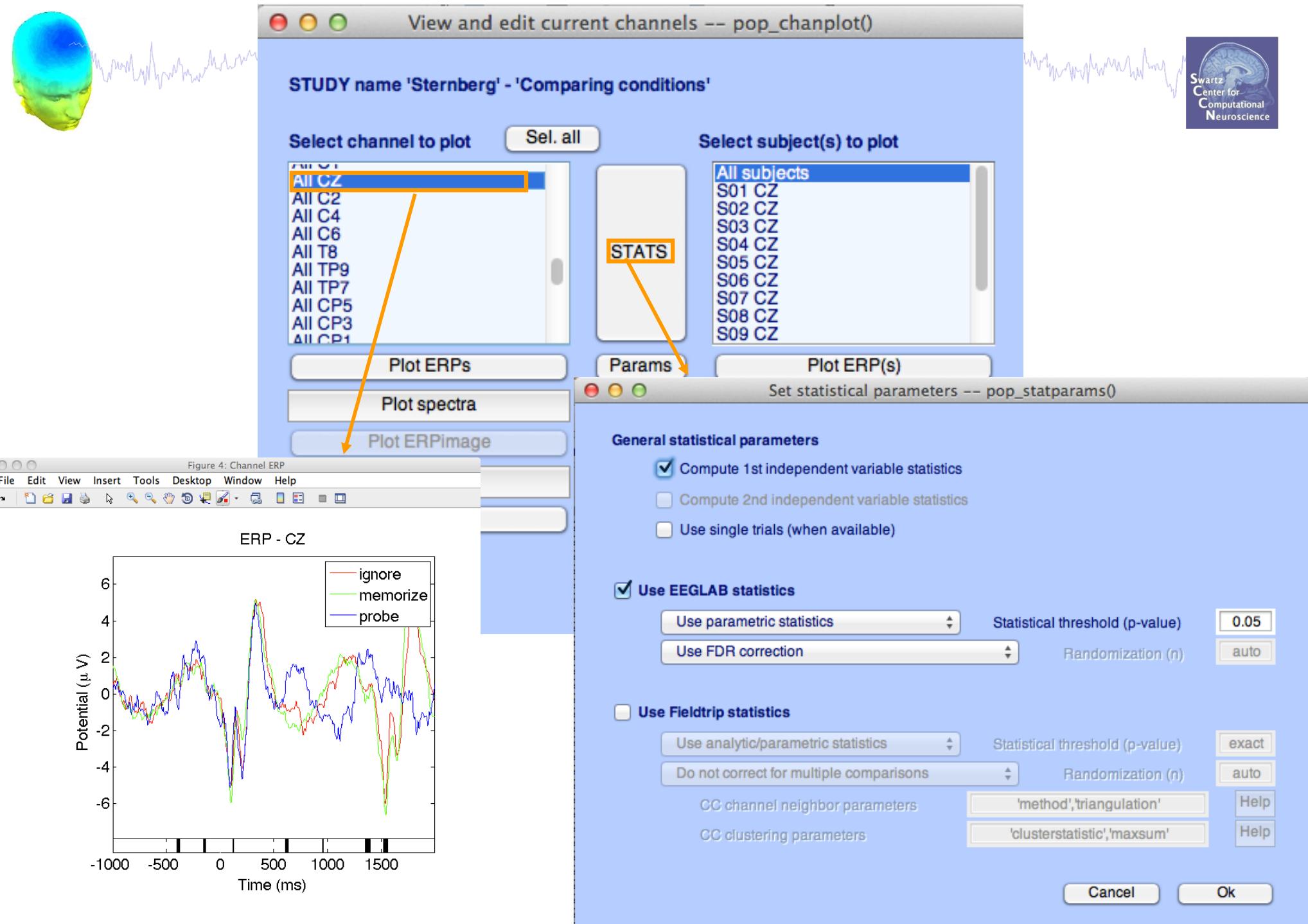
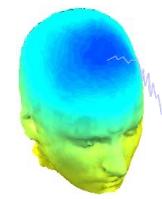
ERP-image across subjects

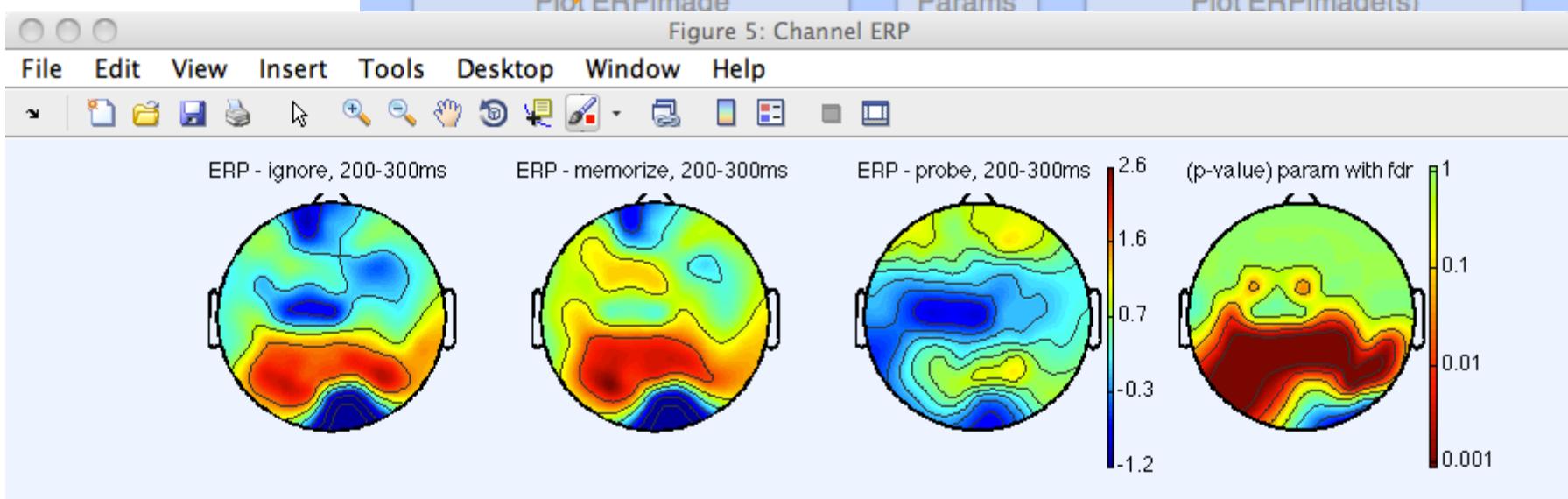
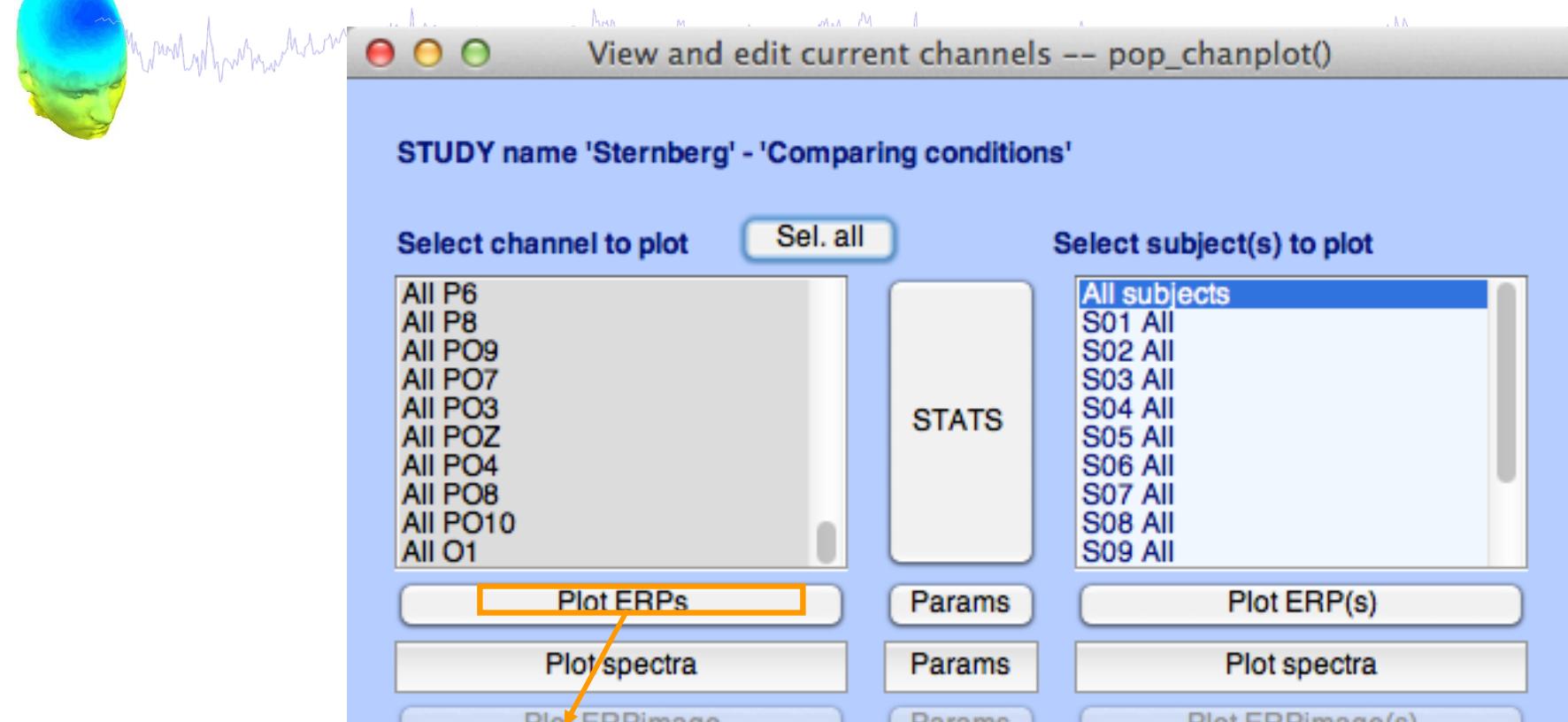
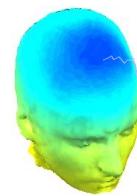


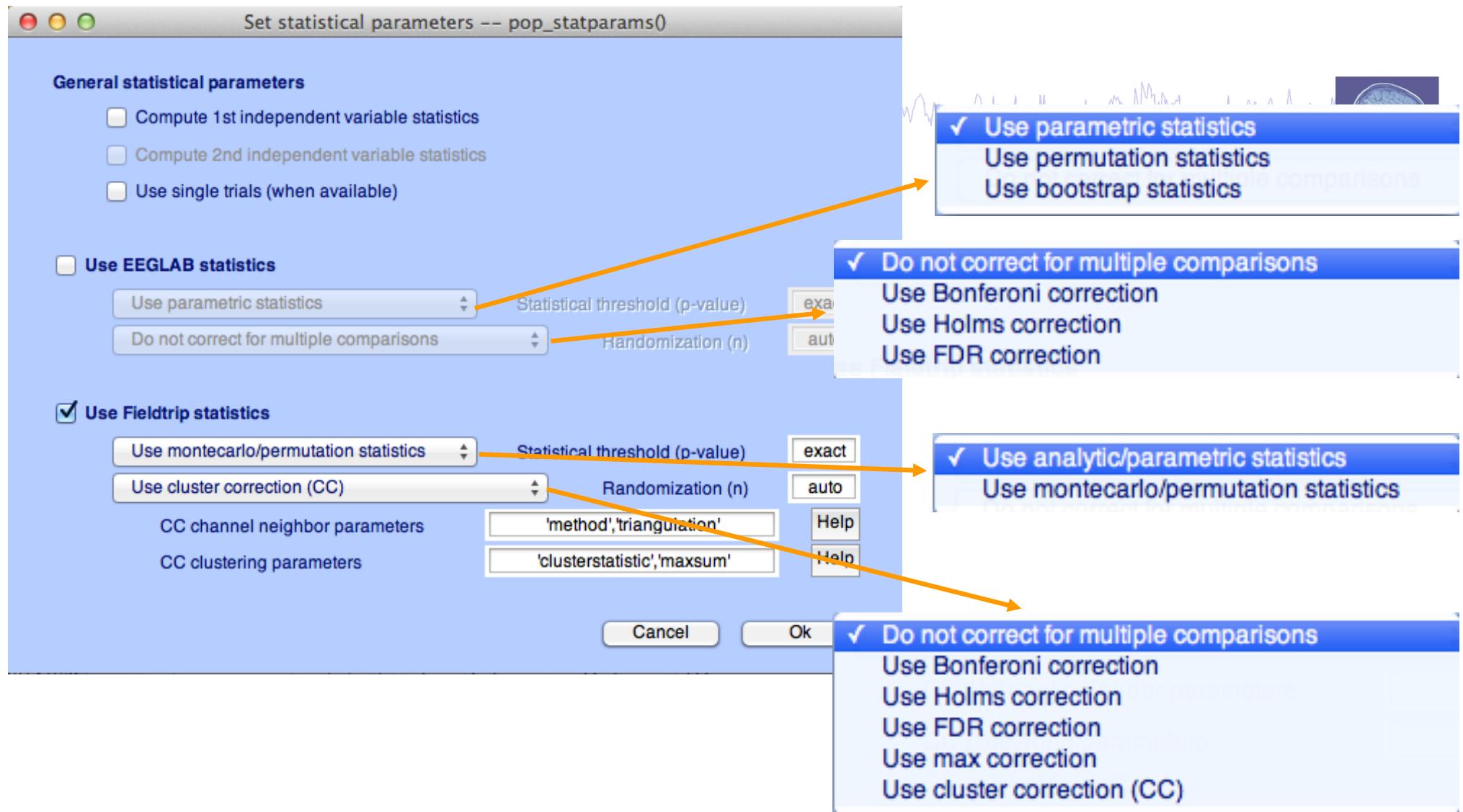
Delorme, A., Miyakoshi., M., Jung, T.P., Makeig, S. (2014) **Grand average ERP-image plotting and statistics: A method for comparing variability in event-related single-trial EEG activities across subjects and conditions.** J Neurosci Methods. 2014 Oct 22. pii: S0165-0270(14)00363-X. doi: 10.1016/j.jneumeth.2014.10.003

Figure 7



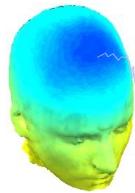






std_stat() function in EEGLAB

Exercises



1. Load “stern.study” file in STUDY folder
2. Edit STUDY design and delete current variable(s)
3. Create a new indep. Variable design to compare Ignore vs. Memorize letter
4. Recompute spectrum and ERP (remove labeled ICA comp.)
5. Plot scalp topography at 200-300 ms (ERP) for both conditions
6. Plot scalp topography at 10Hz for both conditions using no correction, FDR correction and permutation statistics cluster correction (Fieldtrip – statistics)