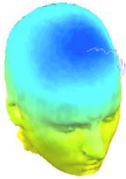


STUDY plot menu



Task 1

Plot cluster summaries

Task 2

Plot individual ICs

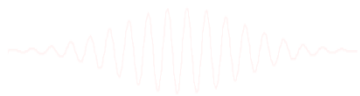
Task 3

Plot using statistical thresholds

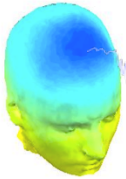
Task 3

Eliminate/reassign ICs

Exercise...



Precompute data measures



EEGLAB v9.0.0.0b

File Edit Tools Plot **Study** Datasets Help

STUDY set:

Study filename:	...s/data
Study task name	
Nb of subjects	
Nb of conditions	
Nb of sessions	
Nb of groups	
Epoch consistency	
Channels per frame	61
Channel locations	yes
Clusters	1
Status	Pre-clustered
Total size (Mb)	8.2

Edit study info
Select/Edit study design(s)
Precompute channel measures
Plot channel measures

Precompute component measures
Measure Product clustering ▶
PCA clustering (original) ▶
Edit/plot clusters

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
Cis 2
Cis 3
Cis 4

List of measures to precompute

ERPs Baseline ([min max] in ms)

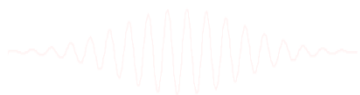
Power spectrum Spectopo parameters 'specmode', 'fft'

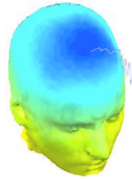
ERSPs } Time/freq. parameters 'cycles', [3 0.5], 'nfreqs', 100

ITCs }

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

Recompute even if present on disk





Choose which channel

Choose which subject

View and edit current channels -- pop_chanplot()

Study "

Select channel to plot Sel. all

- All FP1
- All FP2
- All F3
- All F4
- All C3
- All C4
- All P2

Select subject(s) to plot

- All subjects
- cba FP1
- clm FP1
- ega FP1
- fsa FP1
- gro FP1
- kkb FP1

Plot ERPs

Plot spectra

Plot ERSPs

Plot ITCs

Plot channel properties

Params

Params

Params

Plot ERP(s)

Plot spectra

Plot ERSP(s)

Plot ITC(s)

Plot channel properties (soon)

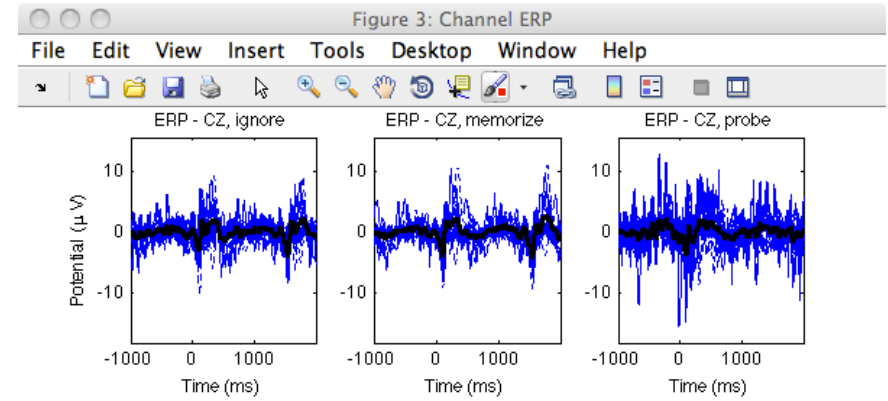
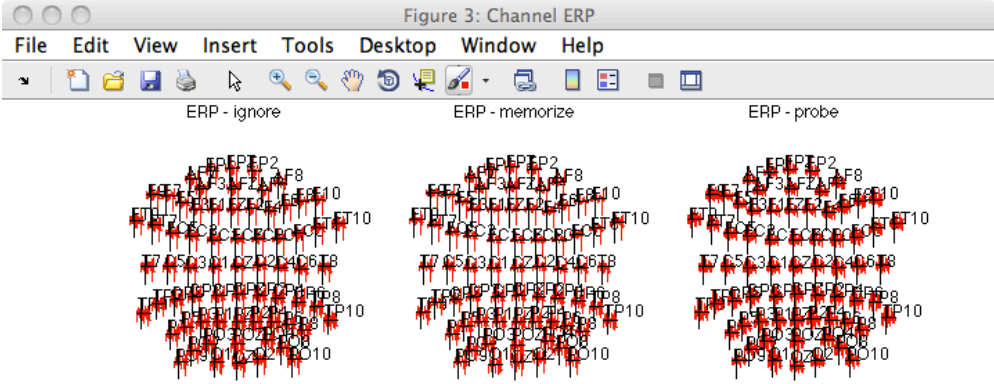
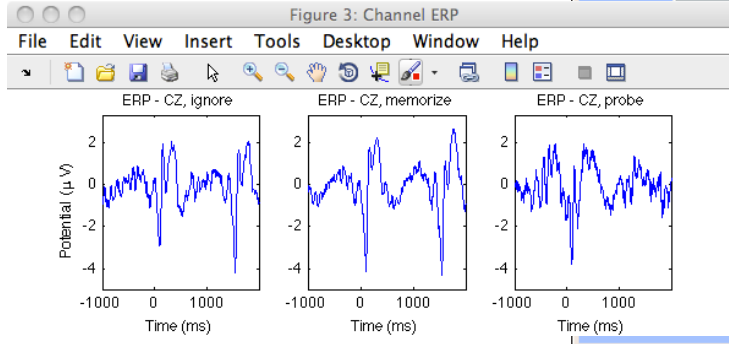
Delete channel group (soon)

Delete channel group (soon)

Save STUDY set to disk

/home/delorme/matlab/animal/animal.stu

Cancel Help Ok





Choose which channel

Choose which subject

View and edit current channels -- pop_chanplot()

Study "

Select channel to plot Sel. all

- AI1 FP1
- AI1 FP2
- AI1 F3
- AI1 F4
- AI1 C3
- AI1 C4
- AI1 P2

Plot ERPs

Params

Select subject(s) to plot

- All subjects
- cba FP1
- clm FP1
- ega FP1
- fsa FP1
- gro FP1
- web FP1

Plot ERP(s)

Params

Params

Params

Plot spectra

Plot ERSP(s)

Plot ITC(s)

Plot channel properties

Plot channel properties (soon)

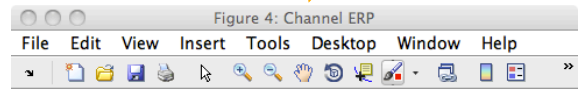
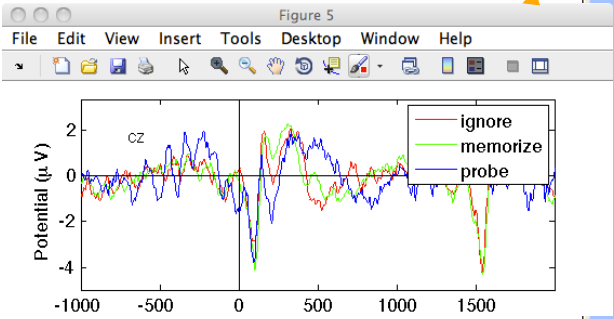
Create channel group (soon)

Edit channel group (soon)

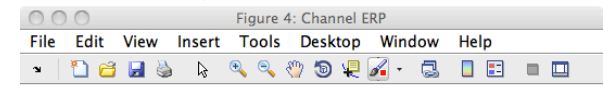
Save STUDY set to disk

/home/delorme/matlab/animal/animal.stu ...

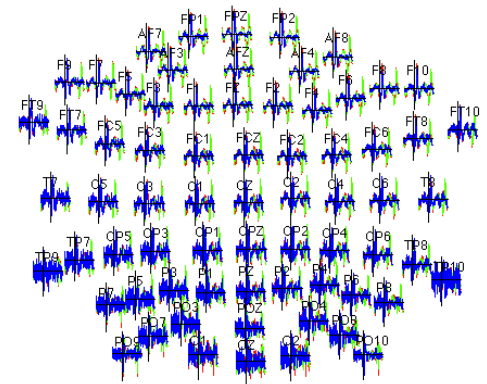
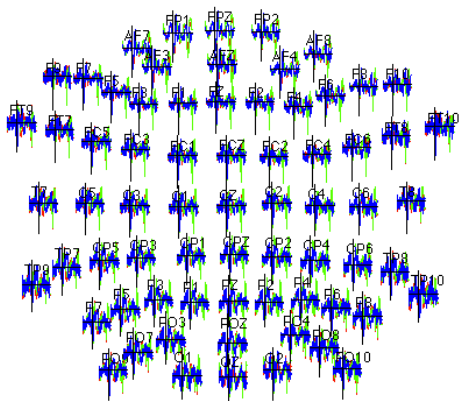
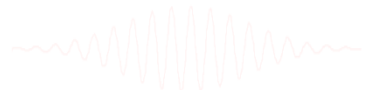
Cancel Help Ok

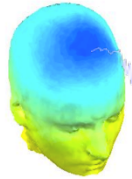


ERP



S03 ERP





View and edit current channels -- pop_chanplot()

Study "

Select channel to plot Sel. all

- All FP1
- All FP2
- All F3
- All F4
- All C3
- All C4
- All P3

Plot ERPs
Plot spectra
Plot ERSPs
Plot ITCs
Plot channel properties

Create channel group (soon)
Edit channel group (soon)

Save STUDY set to disk

Cancel

Select subject(s) to plot

- All subjects
- cba FP1
- clm FP1
- ega FP1
- fsa FP1
- gro FP1
- kek FP1

Plot ERP(s)
Plot spectra
Plot ERSP(s)
Plot ITC(s)
Plot channel properties (soon)

Delete channel group (soon)

Set parameters for plotting ERPs -- pop_erpparams()

Time range in ms [low high] Plot limits in uV [low high]

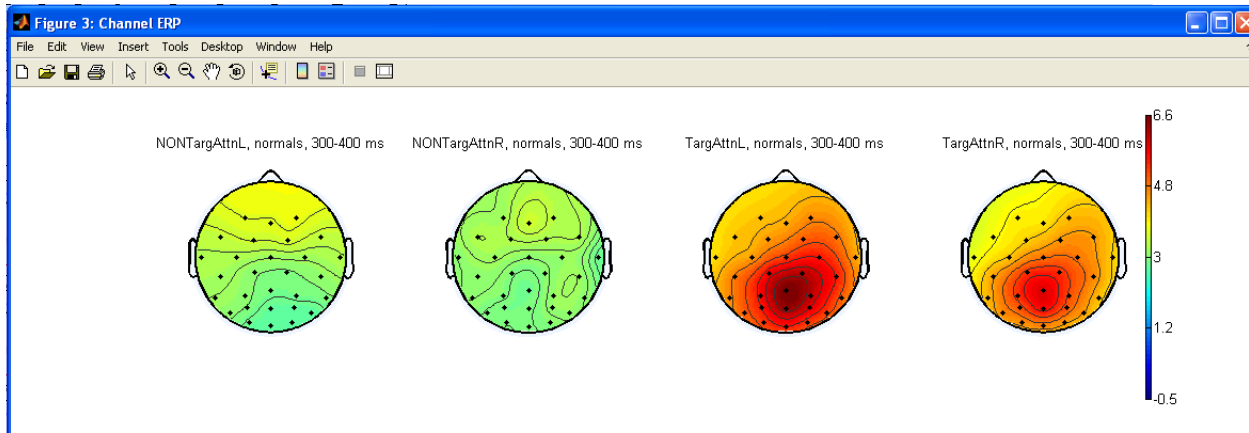
Plot scalp map at latency [ms] Display filter in Hz [high]

Plot conditions on the same panel
 Plot groups on the same panel

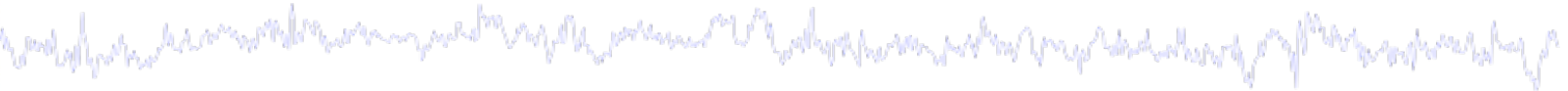
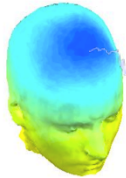
Statistics Threshold

Compute condition statistics
 Compute group statistics

Cancel Help Ok



View and edit clusters



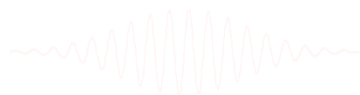
EEGLAB v6.0b

File Edit Tools Plot **Study** Datasets Help

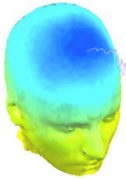
STUDY set: At

Study filename:
Study task name
Nb of subjects
Nb of conditions
Nb of sessions
Nb of groups
Epoch consistency yes
Channels per frame 31
Channel locations yes
Clusters 26
Status Pre-clustered
Total size (Mb) 39.1

- Edit study info
- Precompute channel measures
- Plot channel measures
- Precompute component measures
- Build preclustering array
- Cluster components
- Edit/plot clusters**



Plot cluster data



View and edit current component clusters -- pop_clustedit()

Study 'Attention': 181 of 181 components clustered

Select cluster to plot

- All cluster centroids
- ParentCluster 1 (181 ICs)
- outlier 2 (1 ICs)
- Cls 3 (5 ICs)

Plot scalp maps

Plot dipoles

Plot ERPs

Plot spectra

Plot ERSPs

Plot ITCs

Plot cluster properties

Create new cluster

Rename selected cluster

Merge clusters

Save STUDY set to disk /home/julie/

Cancel Help

Params

Params

Params

Select component(s) to plot

- 'outlier 2' comp. 1 (S12 IC12)
- 'Cls 3' comp. 1 (S01 IC1)
- 'Cls 3' comp. 2 (S05 IC11)
- 'Cls 3' comp. 3 (S06 IC15)

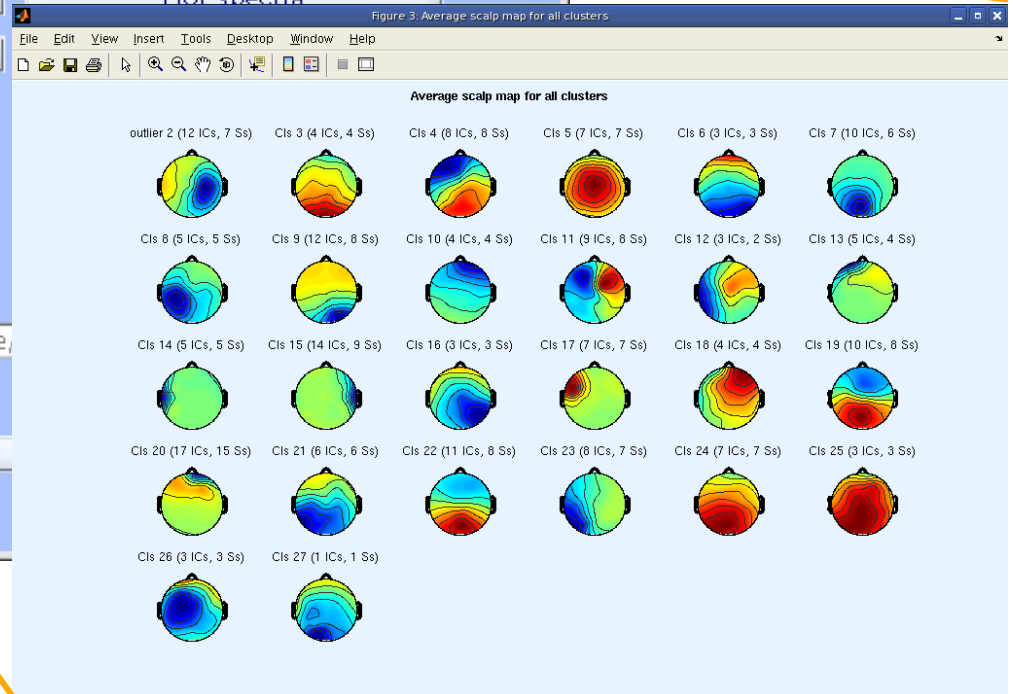
Plot scalp map(s)

Plot dipole(s)

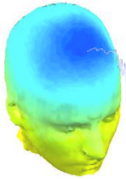
Plot ERP(s)

Plot spectra

Plot mean scalp maps for easy reference



Plot cluster data



View and edit current component clusters -- pop_clustedit()

Study 'Attention': 181 of 181 components clustered

Select cluster to plot

- Cls 6 (3 ICs)
- Cls 7 (10 ICs)**
- Cls 8 (5 ICs)
- Cls 9 (12 ICs)

Select component(s) to plot

- All components**
- S01 IC6
- S05 IC9
- S06 IC12

Plot scalp map(s)

Plot dipoles

Plot ERPs

Plot spectra

Plot ERSPs

Plot ITCs

Plot cluster properties

Create new cluster

Rename selected cluster

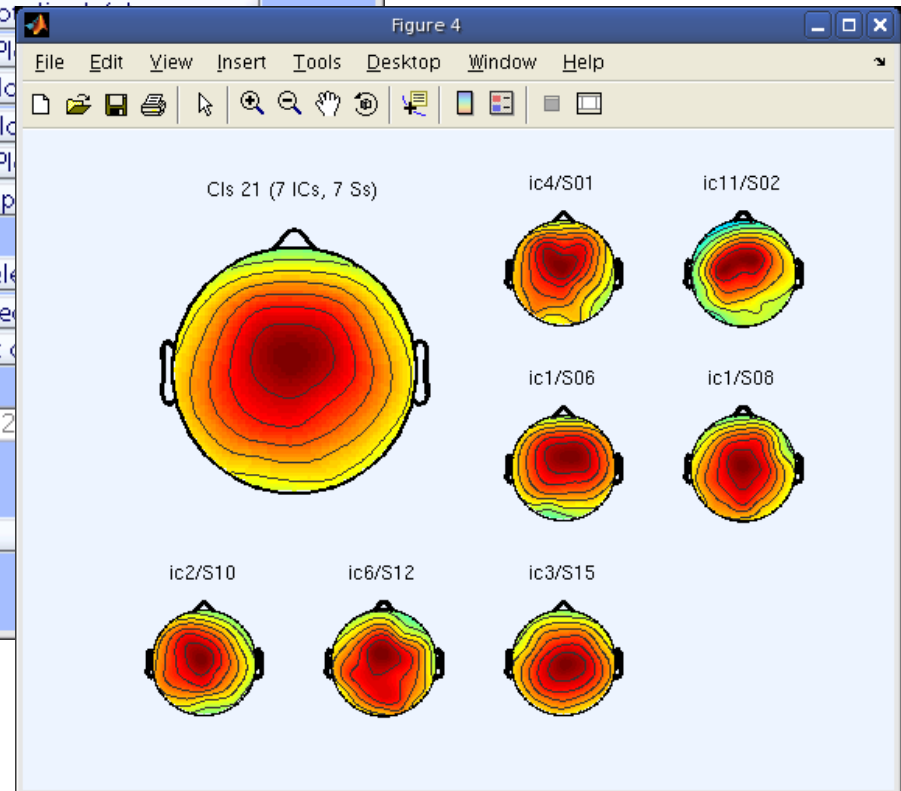
Merge clusters

Save STUDY set to disk /home/julie/WorkshopSD2

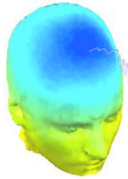
Cancel Help

Choose which cluster

Choose which components



Plot cluster data



The screenshot displays the MNE software interface for plotting cluster data. It features two main windows: 'Cls 19 - 5 sets - 14 components (14 dipoles)' and 'component clusters -- pop_clustedit()'. The 'Cls 19' window shows a brain slice with 15 dipoles (blue dots) and a list of parameters for the selected component (IC3, S02). The 'component clusters' window allows for selecting components to plot and offers various visualization options like scalp maps, dipoles, ERPs, spectra, ERSPs, and ITCs. An orange arrow points to the 'Plot dipole(s)' option in the 'component clusters' window. At the bottom, there are buttons for 'Cancel', 'Help', and 'Ok', along with a 'Save STUDY set to disk' checkbox and a file path input field.

Cls 19 - 5 sets - 14 components (14 dipoles)

File Edit View Insert Tools Desktop Window Help

15 dipoles:

- Plot one
- Keep|Next
- Next
- Prev
- Keep|Prev
- 1
- IC3, S02
- RV: 2.62%
- X tal: -6
- Y tal: -13
- Z tal: 21

Display:

- Mesh on
- Tight view
- Sagittal view
- Coronal view
- Top view
- No controls

component clusters -- pop_clustedit()

Select component(s) to plot

- All components
- S02 IC3
- S02 IC11
- S02 IC12
- S02 IC17

Plot scalp map(s)

Plot dipole(s)

Plot ERP(s)

Plot spectra

Plot ERSP(s)

Plot ITC(s)

Plot component properties

Params

Params

Params

Plot scalp maps

Plot dipoles

Plot ERPs

Plot spectra

Plot ERSPs

Plot ITCs

Plot cluster properties

Create new cluster

Rename selected cluster

Merge clusters

Reassign selected component(s)

Remove selected outlier comps.

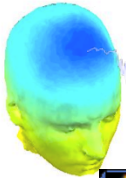
Auto-reject outlier components

Save STUDY set to disk

/home/julie/workshop06/5subjects/WSstudy.study

Cancel Help Ok

Plot cluster data



Study "": 151 of 151 components clustered

Select cluster to plot

- Cls 15 (8 ICs)
- Cls 16 (6 ICs)
- Cls 17 (4 ICs)
- Cls 18 (14 ICs)
- Cls 19 (14 ICs)

Select component(s) to plot

- All components
- S02 IC3
- S02 IC11
- S02 IC12
- S02 IC17

Set ERP plotting parameters -- pop_erpparams()

Time range in ms [low high]

Plot scalp map at latency [ms]

Plot conditions on the same panel

Plot groups on the same panel

Statistical method to use

Compute condition statistics

Compute group statistics

Use single trials (when available)

Use False Discovery Rate to correct for multiple comparisons

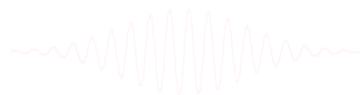
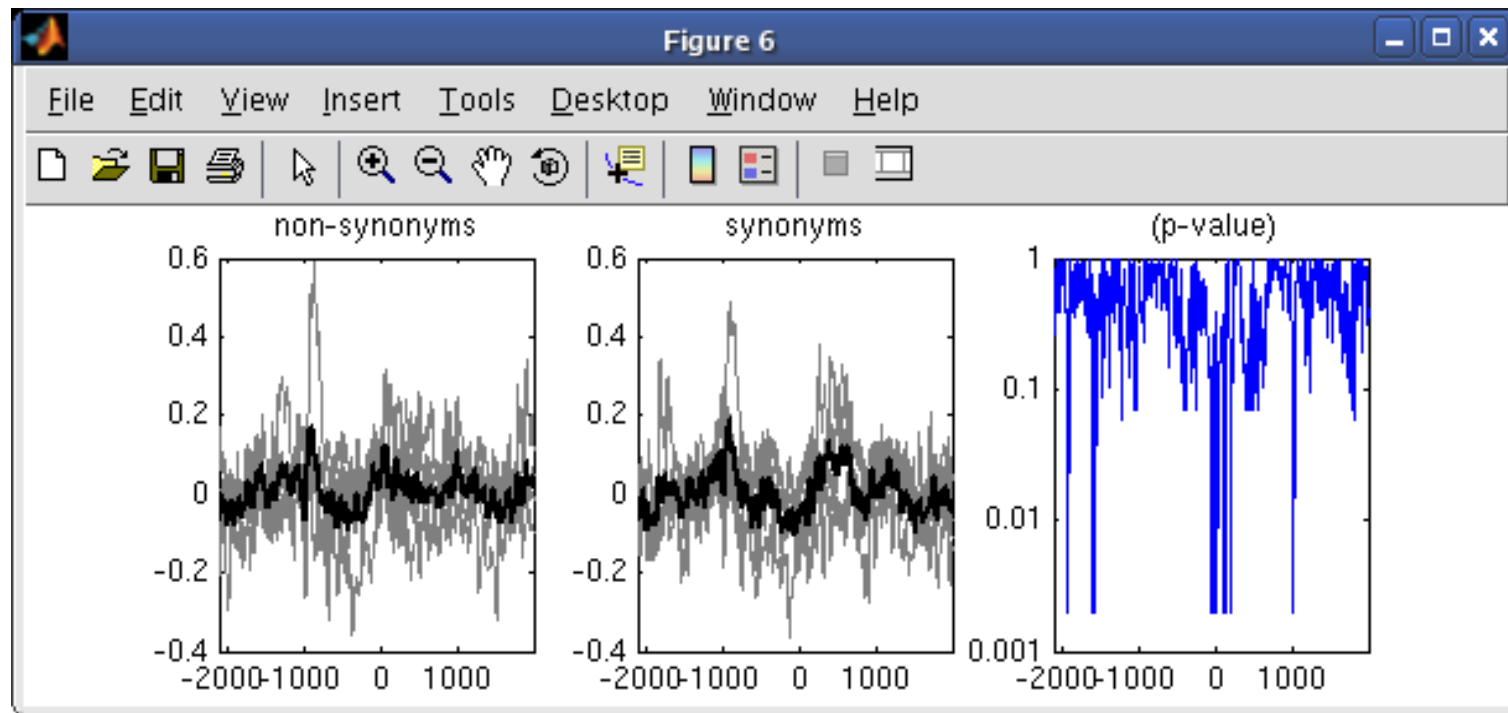
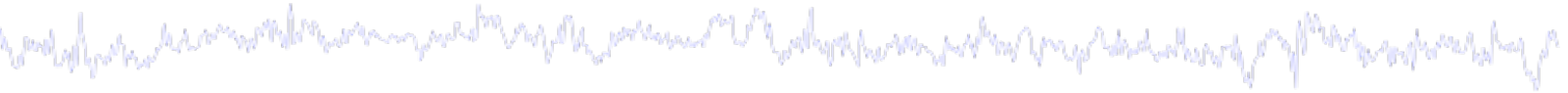
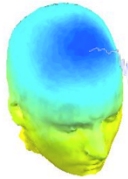
Plot limits in uV [low high]

Display filter in Hz [high]

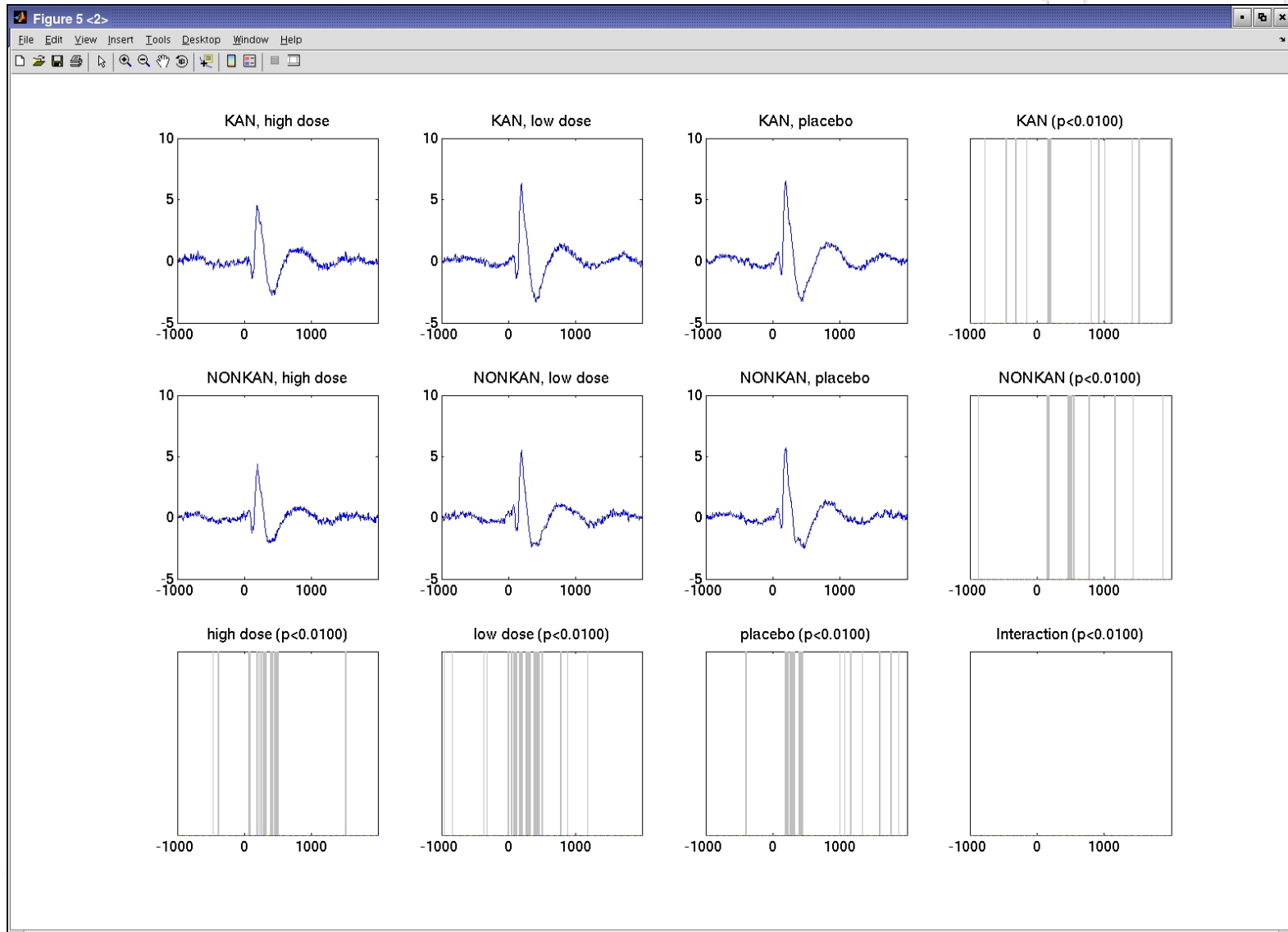
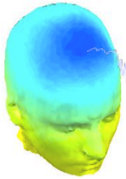
Statistical threshold (p<)

Buttons: Help, Cancel, Ok

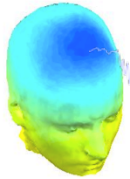
Plot cluster ERP



STUDY ERPs with p-value



Other plotting options...



Set ERP plotting parameters -- pop_erpparams()

Time range in ms [low high] Plot limits in uV [low high]

Plot scale map at latency (ms) Display filter in Hz [high]

Plot conditions on the same panel

Plot groups on the same panel

Statistical method to use

Compute condition statistics

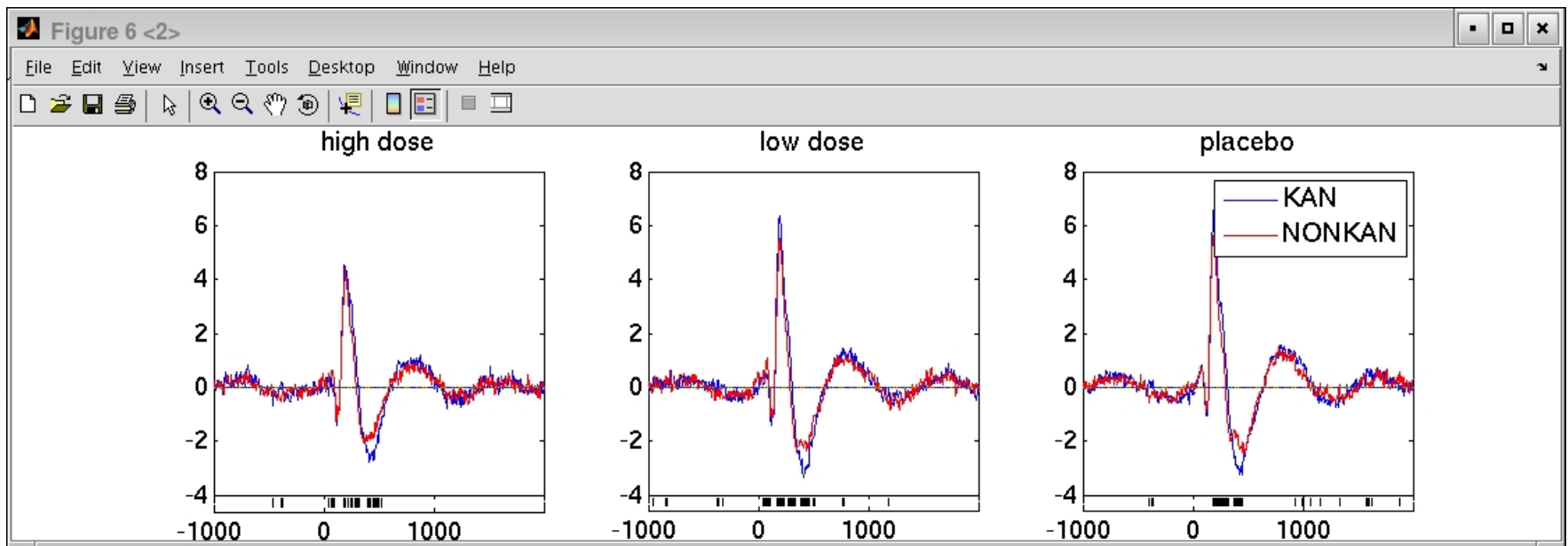
Compute group statistics

Use single trials (when available)

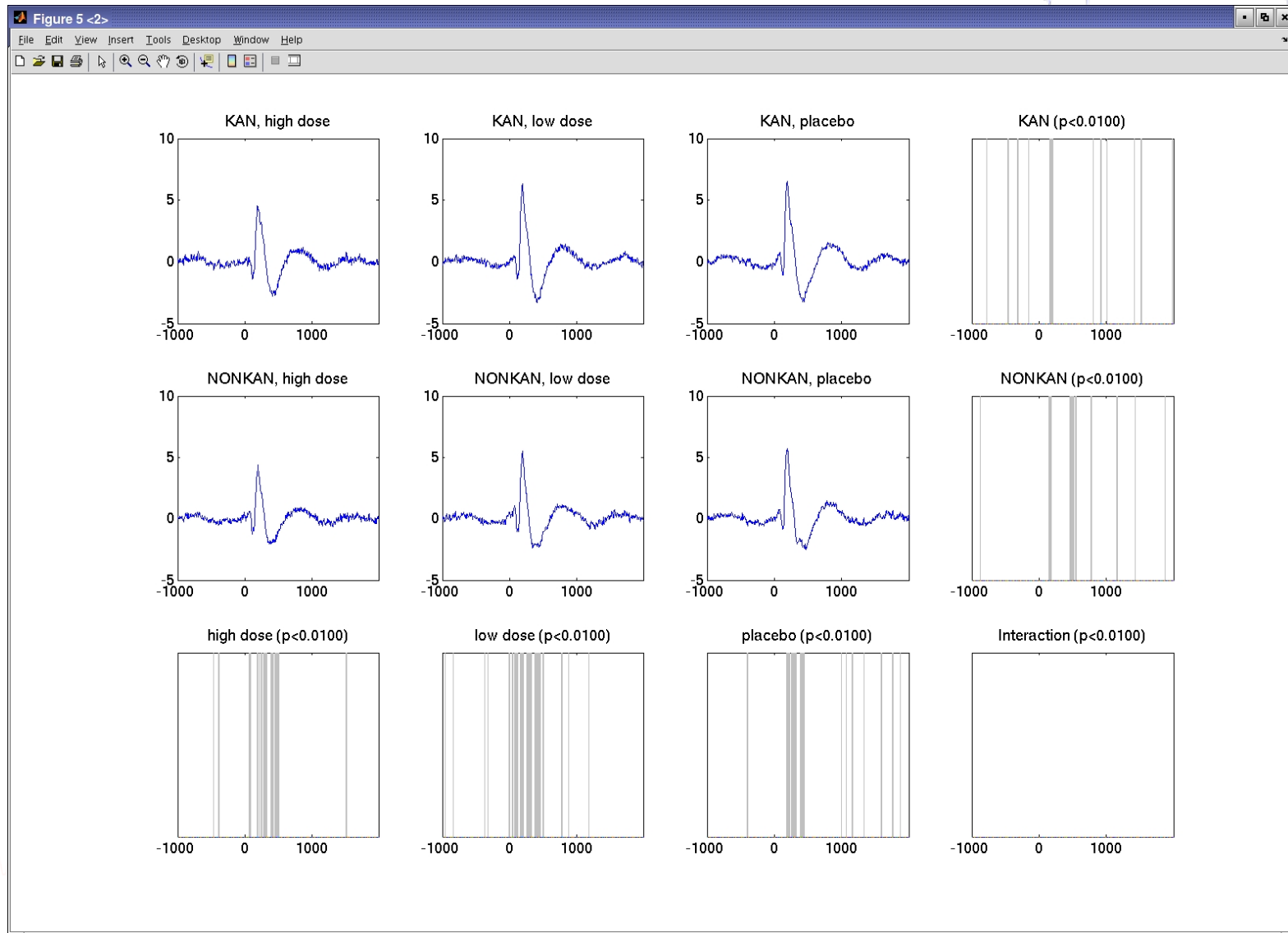
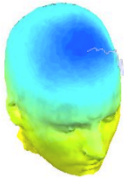
Use False Discovery Rate to correct for multiple comparisons

Statistical threshold (p<)

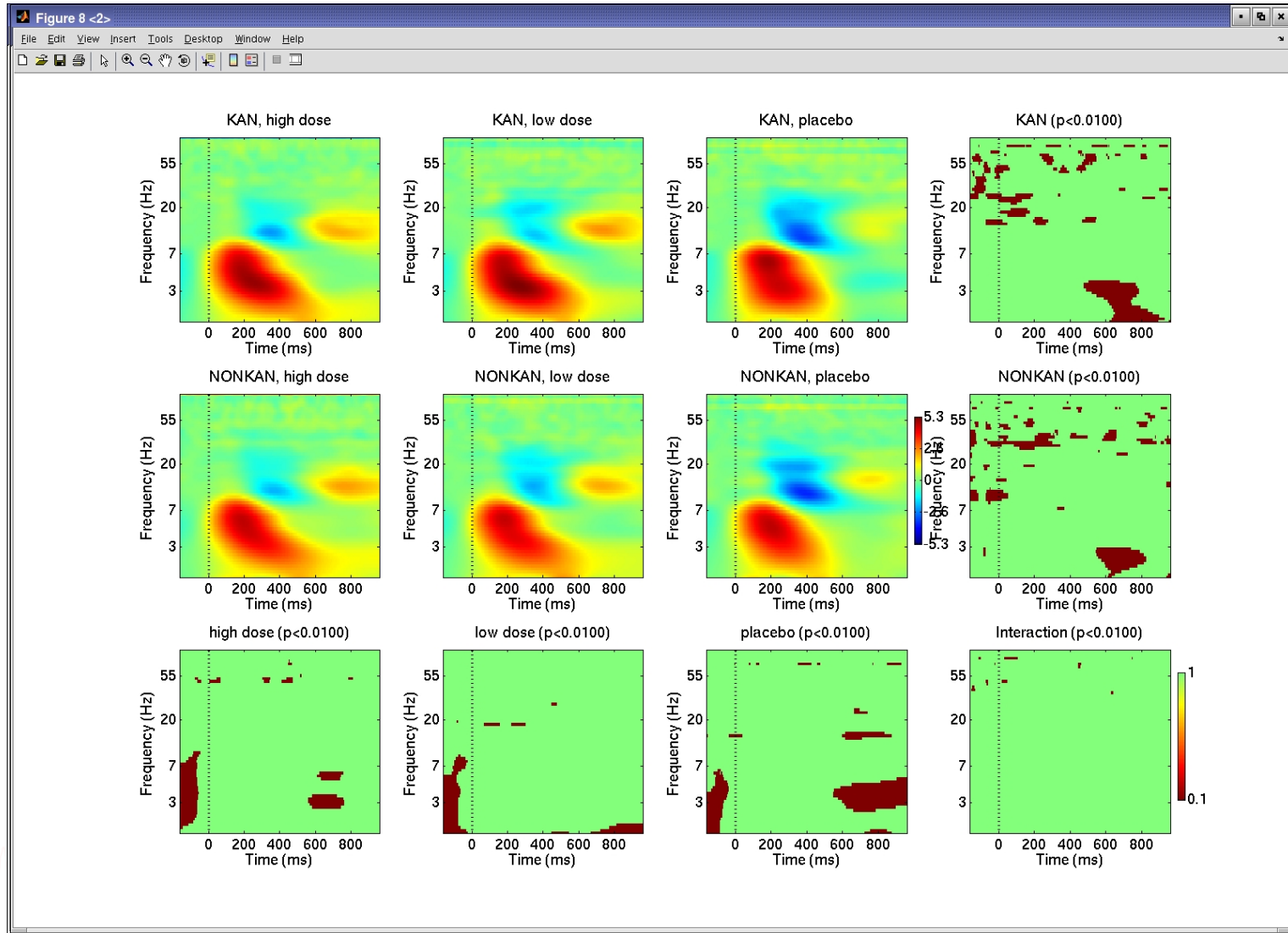
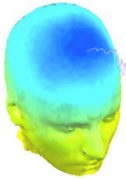
Help Cancel Ok



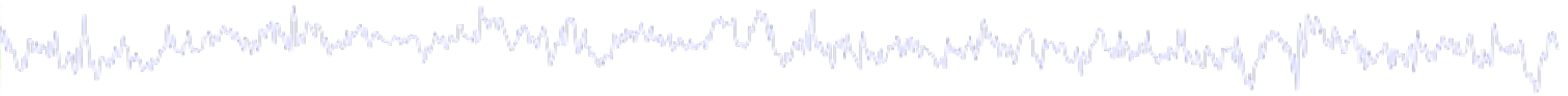
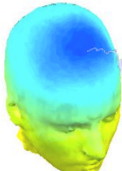
STUDY ERPs with threshold



STUDY ERSPs with statistics



Reassigning components



View and edit current component clusters -- pop_clustedit()

Study #: 151 of 151 components clustered

Select cluster to plot

- Cls 12 (6 ICs)
- Cls 13 (5 ICs)
- Cls 14 (11 ICs)

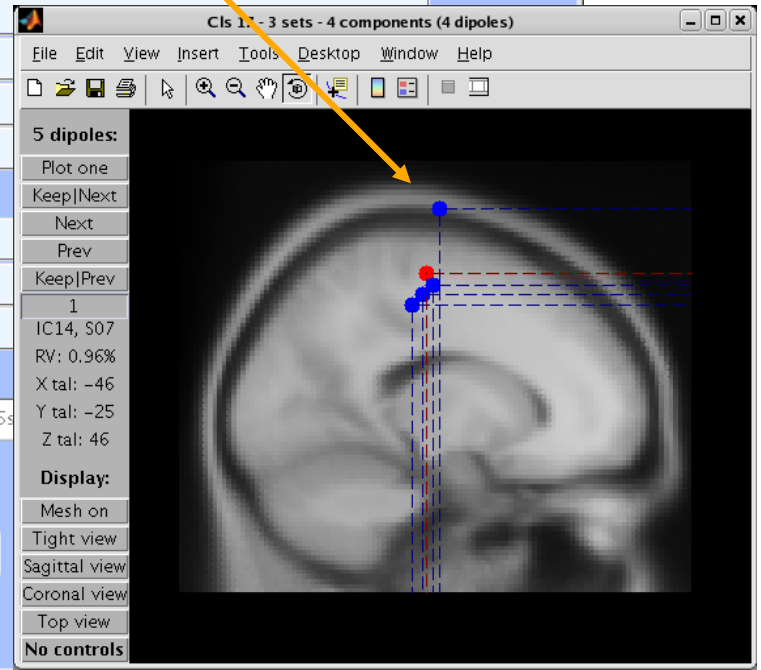
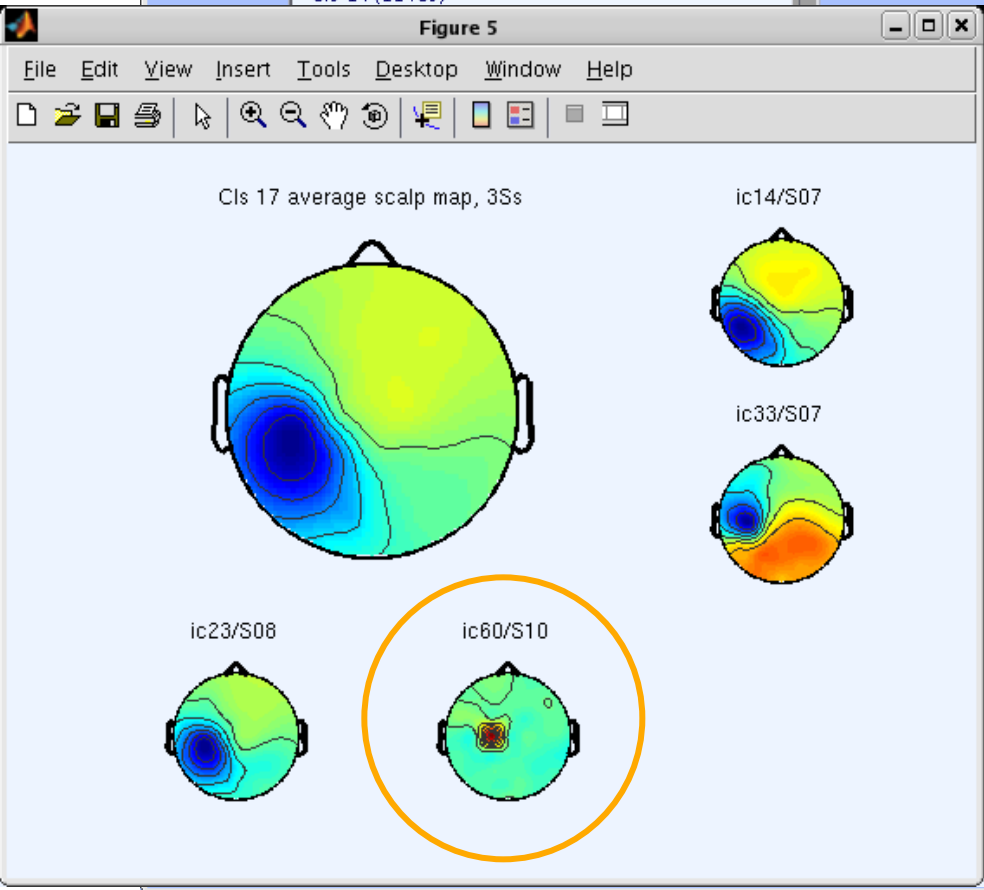
Select component(s) to plot

- All components
- S07 IC14
- S07 IC33
- S08 IC23
- S10 IC60

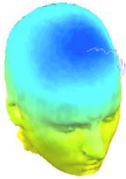
Plot scalp map(s)

Plot dipole(s)

Plot ERP(s)



Reassigning components



View and edit current component clusters -- pop_clustedit()

Study #: 151 of 151 components clustered

Select cluster to plot

- Cls 13 (5 ICs)
- Cls 14 (11 ICs)
- Cls 15 (8 ICs)
- Cls 16 (6 ICs)
- Cls 17 (4 ICs)

Select component(s) to plot

- All components
- S07 IC14
- S07 IC33
- S08 IC22
- S10 IC60

Plot scalp maps

Plot dipoles

Plot ERPs

Plot spectra

Plot ERSPs

Plot ITCs

Plot cluster properties

Create new cluster

Rename selected cluster

Merge clusters

Save STUDY set to disk /home/julie/workshop06/5subjects/WSstudy.study ...

Cancel Help Ok

Remove outliers - from pop_clustedit()

Remove currently selected component below from Cls 17 to its outlier cluster?

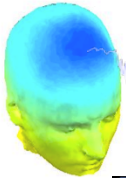
- S10 IC60

Cancel Ok

Remove selected outlier comps.

Auto-reject outlier components

Outlier cluster reassignment



View and edit current component clusters -- pop_clustedit()

Study #: 151 of 151 components clustered

Select cluster to plot

- Cls 16 (6 ICs)
- Cls 17 (3 ICs)
- Cls 18 (14 ICs)
- Cls 19 (14 ICs)
- Outliers Cls 17 20 (1 ICs)

Select component(s) to plot

- All components
- S10 IC60

Plot scalp maps

Plot dipoles

Plot ERPs

Plot spectra

Plot ERSPs

Plot ITCs

Plot cluster properties

Params

Params

Params

Plot scalp map(s)

Plot dipole(s)

Plot ERP(s)

Plot spectra

Plot ERSP(s)

Plot ITC(s)

Plot component properties

Create new cluster

Rename selected cluster

Merge clusters

Reassign selected component(s)

Remove selected outlier comps.

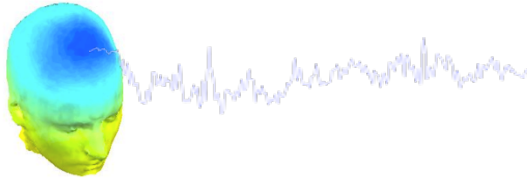
Auto-reject outlier components

Save STUDY set to disk

/home/julie/workshop06/5subjects/WSstudy.study

Cancel Help Ok

Parameters



ERP

Set ERP plotting parameters -- pop_erpparams()

Time range in ms [low high]

Plot scalp map at [latency [ms]]

Plot conditions on the same panel

Plot groups on the same panel

Statistical method to use

Compute condition statistics

Compute group statistics

Use single trials (when available)

Use False Discovery Rate to correct for multiple comparisons

Plot limits in uV [low high]

Display filter in Hz [high]

Statistical threshold (p<)

Help Cancel Ok

Spectrum

Set spectrum plotting parameters -- pop_specparams()

Frequency [low_Hz high_Hz]

Plot scalp map at freq. [Hz]

Subtract individual subject mean spectrum

Plot conditions on the same panel

Plot groups on the same panel

Plot limits [low high]

ERSP/ITC

Set ERSP|ITC plotting parameters -- pop_erspparams()

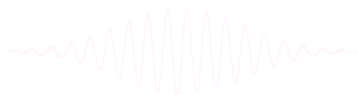
Time range in ms [Low High]

Freq. range in Hz [Low High]

Power limits in dB [Low High]

Compute ERSP baseline across conditions

ITC limit (0-1) [High]



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File Edit Tools Plot **Study** Datasets Help

STUDY set:

Study filename: ...s/data
 Study task name
 Nb of subjects
 Nb of conditions
 Nb of sessions
 Nb of groups
 Epoch consistency
 Channels per frame 61
 Channel locations yes
 Clusters 1
 Status Pre-clustered
 Total size (Mb) 8.2

- Edit study info
- Select/Edit study design(s)
- Precompute channel measures
- Plot channel measures
- Precompute component measures
- Measure Product clustering ▶
- PCA clustering (original) ▶
- Edit/plot clusters

Select STUDY design

STUDY.design 1

Add design
 Rename design
 Delete design

Subjects

S01
 S02
 S03
 S04
 S05
 S06
 S07
 S08
 S09
 S10
 S11
 S12
 S13

Select all subjects

Independent variable 1

condition
 duration
 init_index
 init_time
 inset
 load ...

Ind. var. 1 values

ignore
 memorize
 probe

Combine selected values
 Unpaired statistics

Independent variable 2

None
 condition
 duration
 init_index
 init_time
 inset

Ind. var. 2 values

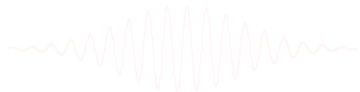
Combine selected values
 Unpaired statistics

Use only specific datasets/trials

Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel Ok



EEGLAB v9.0.0.0b

File Edit Tools Plot **Study** Datasets Help

STUDY set:

Study filename: ...s/data
 Study task name
 Nb of subjects
 Nb of conditions
 Nb of sessions
 Nb of groups
 Epoch consistency
 Channels per frame 61
 Channel locations yes
 Clusters 1
 Status Pre-clustered
 Total size (Mb) 8.2

Edit study info
Select/Edit study design(s)
 Precompute channel measures
 Plot channel measures
 Precompute component measures
 Measure Product clustering ▶
 PCA clustering (original) ▶
 Edit/plot clusters

Select subjects

Select STUDY design

STUDY.design 1

Add design
 Rename design
 Delete design

Subjects

S01
 S02
 S03
 S04
 S05
 S06
 S07
 S08
 S09
 S10
 S11
 S12
 S13

Select all subjects

Independent variable 1

condition
 duration
 init_index
 init_time
 inset
 load ...

Ind. var. 1 values

ignore
 memorize
 probe

Combine selected values
 Unpaired statistics

Independent variable 2

None
 condition
 duration
 init_index
 init_time
 inset

Ind. var. 2 values

Combine selected values
 Unpaired statistics

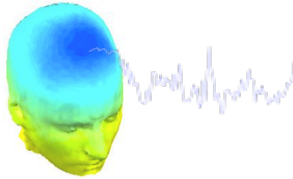
Use only specific datasets/trials

Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel Ok





Edit STUDY design -- pop_studydesign()

Select STUDY design

Audio versus light all subjects
All stimulus type - non dual subjects only
Blank versus other stimulus type - non dual subjects only
Audio preceded by different stimulus types
Audio versus light across sessions - non dual subjects only
Audio versus light across presentation - non dual subjects only

Add design
Rename design
Delete design

Subjects

c1
c2
c3
c4
c5
c6
c7
c8
nd1
nd2
nd3
nd4
nd5
nd6
nd7
nd8

Select all subjects

Independent variable 1

None
group
stimulusType
presentation
session
preevent

Ind. var. 1 values

audio
blank
both
light
audio - light

Combine selected values
Unpaired statistics

Independent variable 2

None
group
stimulusType
presentation
session
preevent

Ind. var. 2 values

control
nondual

Combine selected values
Unpaired statistics

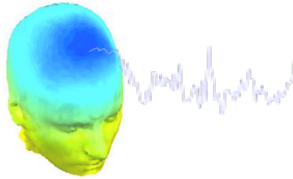
Use only specific datasets/trials

Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel Ok





Edit STUDY design -- pop_studydesign()

Select STUDY design

Audio versus light all subjects
All stimulus type - non dual subjects only
Blank versus other stimulus type - non dual subjects only
Audio preceded by different stimulus types
Audio versus ligh accross sessions - non dual subjects only
Audio versus light accross presentation - non dual subjects only

Add design
Rename design
Delete design

Subjects

c1
c2
c3
c4
c5
c6
c7
c8
nd1
nd2
nd3
nd4
nd5
nd6
nd7
nd8

Select all subjects

Independent variable 1

None
group
stimulusType
presentation
session
preevent

Ind. var. 1 values

audio
blank
both
light
audio - light

Combine selected values
Unpaired statistics

Independent variable 2

None
group
stimulusType
presentation
session
preevent

Ind. var. 2 values

Combine selected values
Unpaired statistics

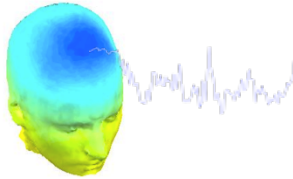
Use only specific datasets/trials

Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel Ok





Edit STUDY design -- pop_studydesign()

Select STUDY design

Audio versus light all subjects
All stimulus type - non dual subjects only
Blank versus other stimulus type - non dual subjects only
Audio preceded by different stimulus types
Audio versus ligh accross sessions - non dual subjects only
Audio versus light accross presentation - non dual subjects only

Add design
Rename design
Delete design

Subjects

c1
c2
c3
c4
c5
c6
c7
c8
nd1
nd2
nd3
nd4
nd5
nd6
nd7
nd8

Select all subjects

Independent variable 1

None
group
stimulusType
presentation
session
preevent

Ind. var. 1 values

audio
blank
both
light
audio - light

Combine selected values
Unpaired statistics

Independent variable 2

None
group
stimulusType
presentation
session
preevent

Ind. var. 2 values

Combine selected values
Unpaired statistics

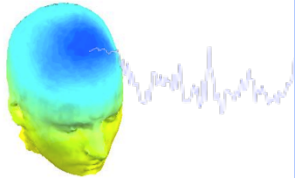
Use only specific datasets/trials

Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel Ok





Edit STUDY design -- pop_studydesign0

Select STUDY design

Audio versus light all subjects
All stimulus type - non dual subjects only
Blank versus other stimulus type - non dual subjects only
Audio preceeded by different stimulus types
Audio versus ligh accross sessions - non dual subjects only
Audio versus light accross presentation - non dual subjects only

Add design
Rename design
Delete design

Subjects

c1
c2
c3
c4
c5
c6
c7
c8
nd1
nd2
nd3
nd4
nd5
nd6
nd7
nd8

Select all subjects

Independent variable 1

None
group
stimulusType
presentation
session
prevevent

Ind. var. 1 values

audio
blank
both
light

Combine selected values
Unpaired statistics

Independent variable 2

None
group
stimulusType
presentation
session
prevevent

Ind. var. 2 values

Combine selected values
Unpaired statistics

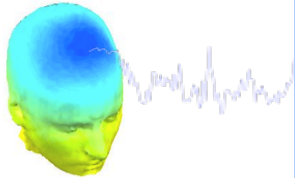
Use only specific datasets/trials

Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel Ok





Edit STUDY design -- pop_studydesign()

Select STUDY design

Audio versus light all subjects
All stimulus type - non dual subjects only
Blank versus other stimulus type - non dual subjects only
Audio preceded by different stimulus types
Audio versus light accross sessions - non dual subjects only
Audio versus light accross presentation - non dual subjects only

Add design
Rename design
Delete design

Subjects

c1
c2
c3
c4
c5
c6
c7
c8
nd1
nd2
nd3
nd4
nd5
nd6
nd7
nd8

Select all subjects

Independent variable 1

None
group
stimulusType
presentation
session
preevent

Ind. var. 1 values

audio
blank
both
light
audio - light

Combine selected values
Unpaired statistics

Independent variable 2

None
group
stimulusType
presentation
session
preevent

Ind. var. 2 values

1
2

Combine selected values
Unpaired statistics

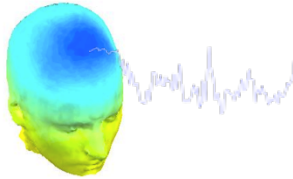
Use only specific datasets/trials

Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel Ok





Edit STUDY design -- pop_studydesign()

Select STUDY design

Audio versus light all subjects
All stimulus type - non dual subjects only
Blank versus other stimulus type - non dual subjects only
Audio preceded by different stimulus types
Audio versus light across sessions - non dual subjects only
Audio versus light across presentation - non dual subjects only

Add design
Rename design
Delete design

Subjects

c1
c2
c3
c4
c5
c6
c7
c8
nd1
nd2
nd3
nd4
nd5
nd6
nd7
nd8

Select all subjects

Independent variable 1

None
group
stimulusType
presentation
session
preevent

Ind. var. 1 values

audio
blank
both
light
audio - light

Combine selected values
Unpaired statistics

Independent variable 2

None
group
stimulusType
presentation
session
preevent

Ind. var. 2 values

evoked
spontaneous

Combine selected values
Unpaired statistics

Use only specific datasets/trials

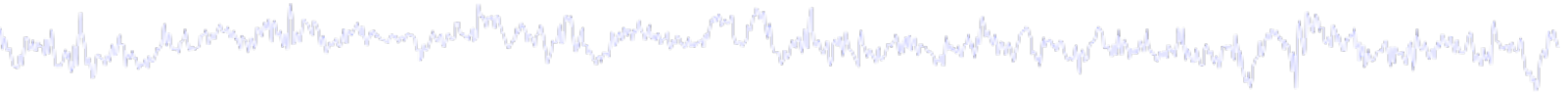
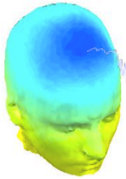
Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel Ok



Exercises



Suggestion for exercises:

Load stern.study in STUDY folder

From the GUI, compute ERP for data channels. Plot grand average ERP for all channels. Experiment with statistics.

Then move to the plotting cluster function. Plot ERSP for frontal midline theta cluster (cluster 19) and remove outliers by hand.

Build a STUDY design to compare letter with high memory load versus letter with low memory load. Recompute spectrum for components and compare the two conditions for the frontal midline cluster (cluster 19).

