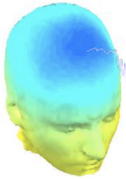


# Data importing and channel analysis



## Task 1

- Import raw data
- Re-reference data
- Scroll channel data

## Task 2

- Import channel location file

## Task 3

- Import data events

## Task 4

- Extract data epochs
- Select epochs/events

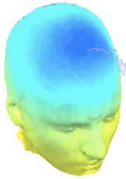
## Task 5

- Channel analysis

[Exercise...](#)



# Data importing and channel analysis



## Task 1

Import raw data

Re-reference data

Scroll channel data

## Task 2

Import channel location file

## Task 3

Import data events

## Task 4

Extract data epochs

Select epochs/events

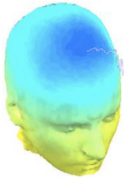
## Task 4

Channel analysis

Exercise...



# The EEGLAB Matlab software



## main graphic interface

```
EEGLAB Shell - Konsole
Session Edit View Bookmarks Settings Help
/home/arno> matlab -nodesktop

      < M A T L A B >
  Copyright 1984-2002 The MathWorks, Inc.
  Version 6.5.0.180913a Release 13
  Jun 18 2002

Using Toolbox Path Cache.  Type "help toolbox_path_cache" for

To get started, type one of these: helpwin, helpdesk, or demo.
For product information, visit www.mathworks.com.

>> eeglab
```

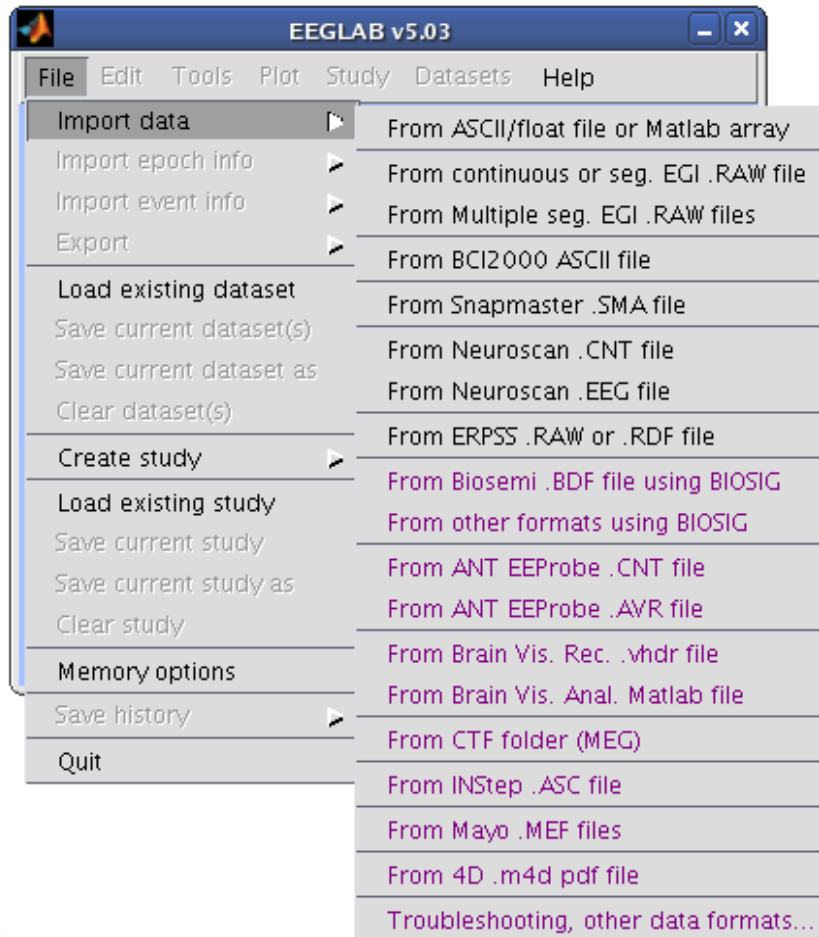
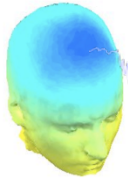
EEGLAB v5.03

File Edit Tools Plot Study Datasets Help

**No current dataset**

- Create a new or load an existing dataset:  
Use "File > Import data" (new)  
Or "File > Load existing dataset" (old)
- If new,  
"File > Import epoch info" (data epochs) else  
"File > Import event info" (continuous data)  
"Edit > Dataset info" (add/edit dataset info)  
"File > Save dataset" (save dataset)
- Prune data: "Edit > Select data"
- Reject data: "Tools > Reject continuous"
- Epoch data: "Tools > Extract epochs"
- Remove baseline: "Tools > Remove"
- Run ICA: "Tools > Run ICA"

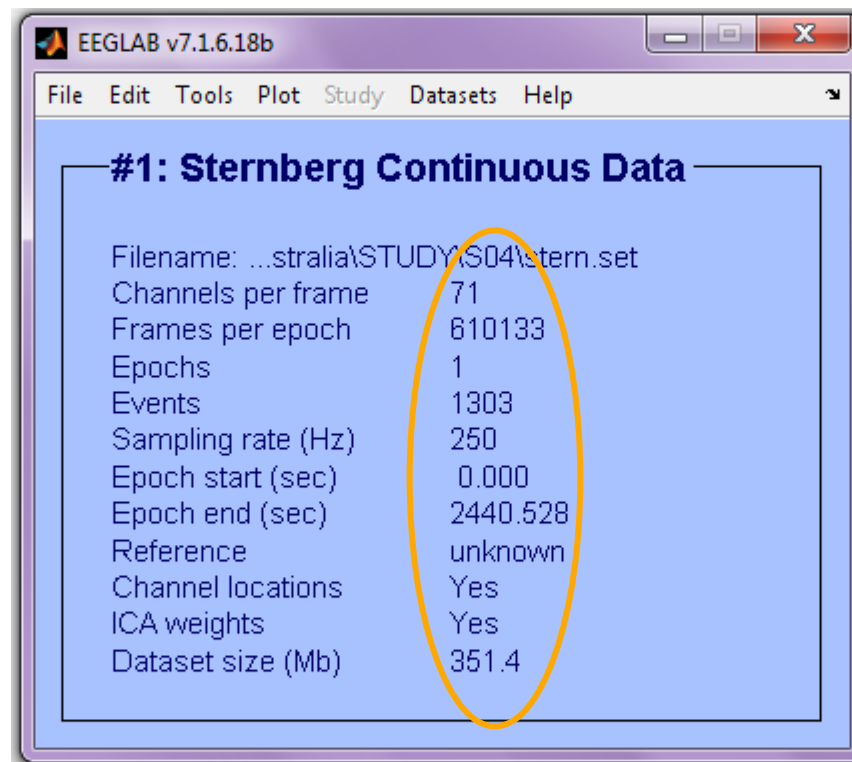
# Importing a dataset



**EEGLAB supports many different raw data formats**



# Imported EEG data



EEGLAB GUI  
displays dataset  
basics



# The example data: Sternberg working memory



## File

../Data/stern.set

## Data

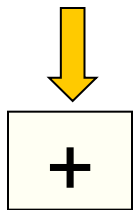
Continuous data (not epoched), ref'd to right mastoid

## Task

3-7 letters to memorize, among 1-5 letters to ignore  
50% chance of probe letter being 'in-set'

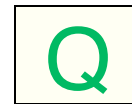
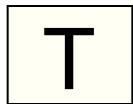
### Fixation

(5 sec)



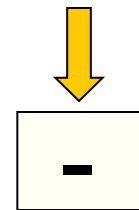
### SOA

(1.4 sec)

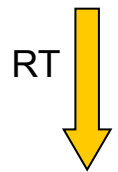
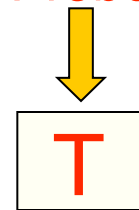


### Maintenance

(2-4 sec)



Probe



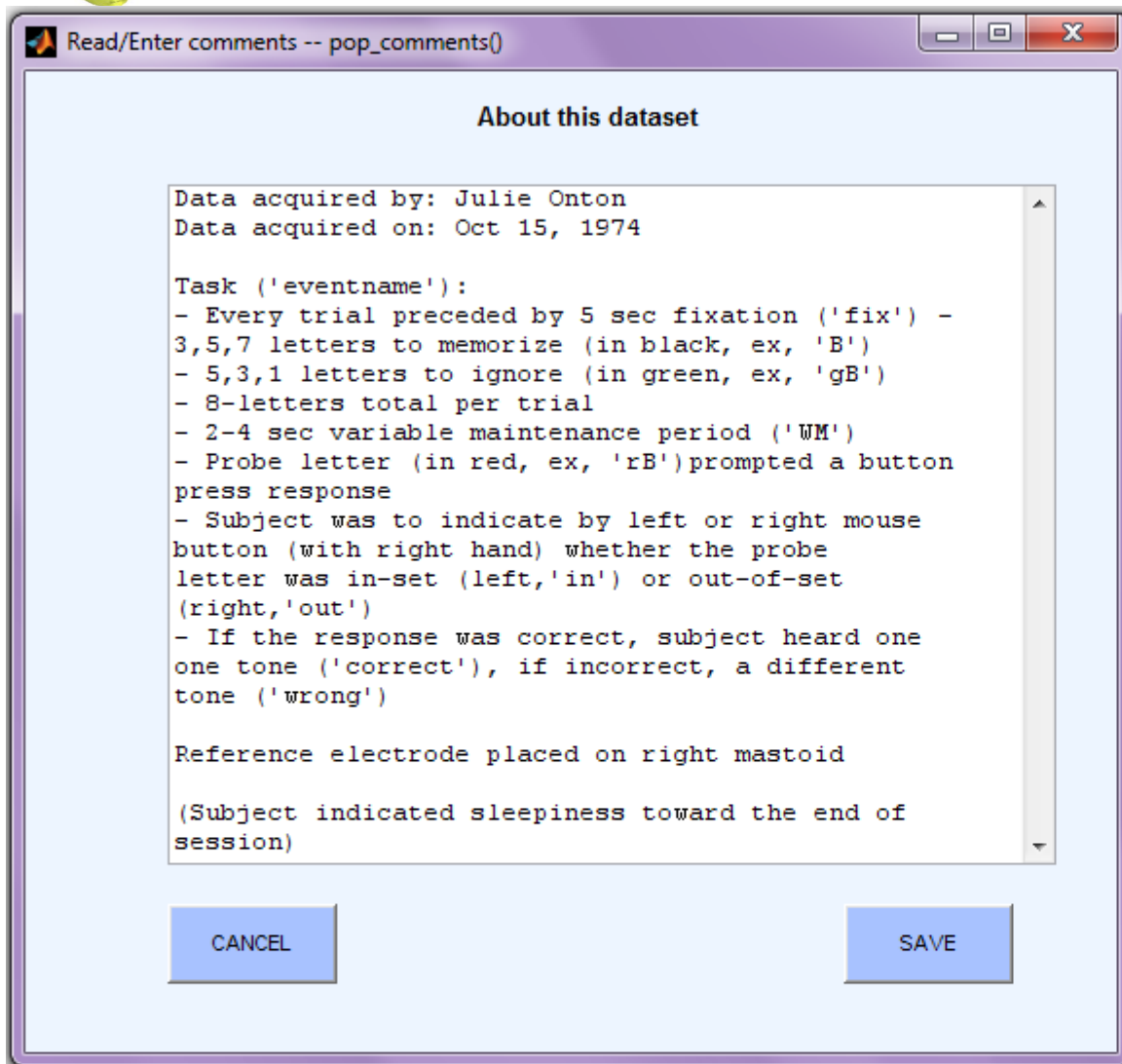
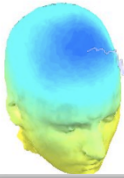
Memorize

Ignore

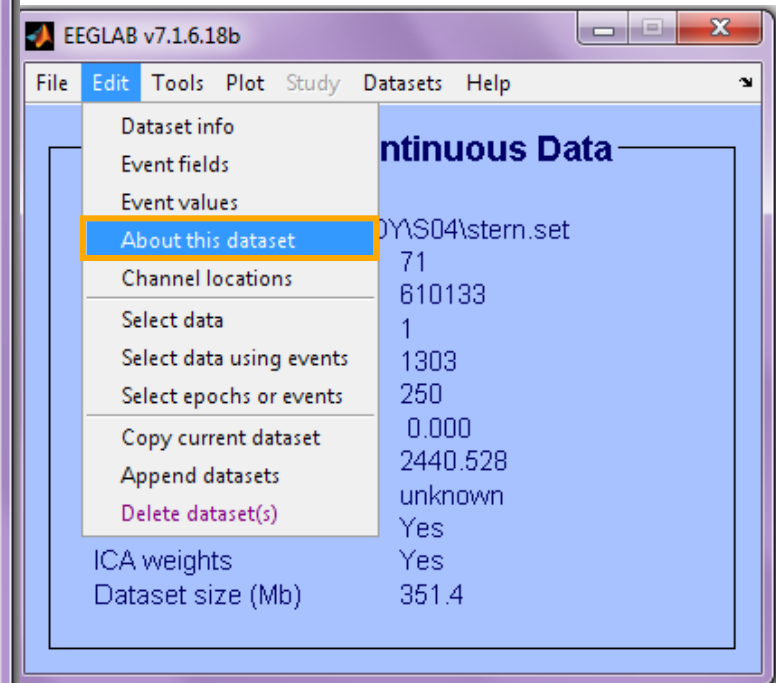
*Was this letter in the memorized set?*

RESPONSE

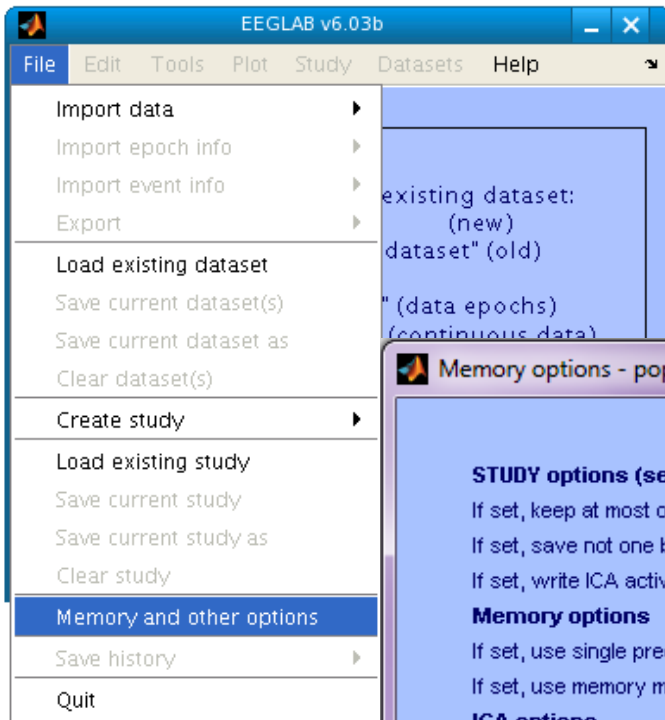
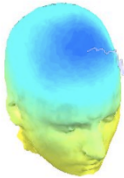
# Comments in EEGLAB structure



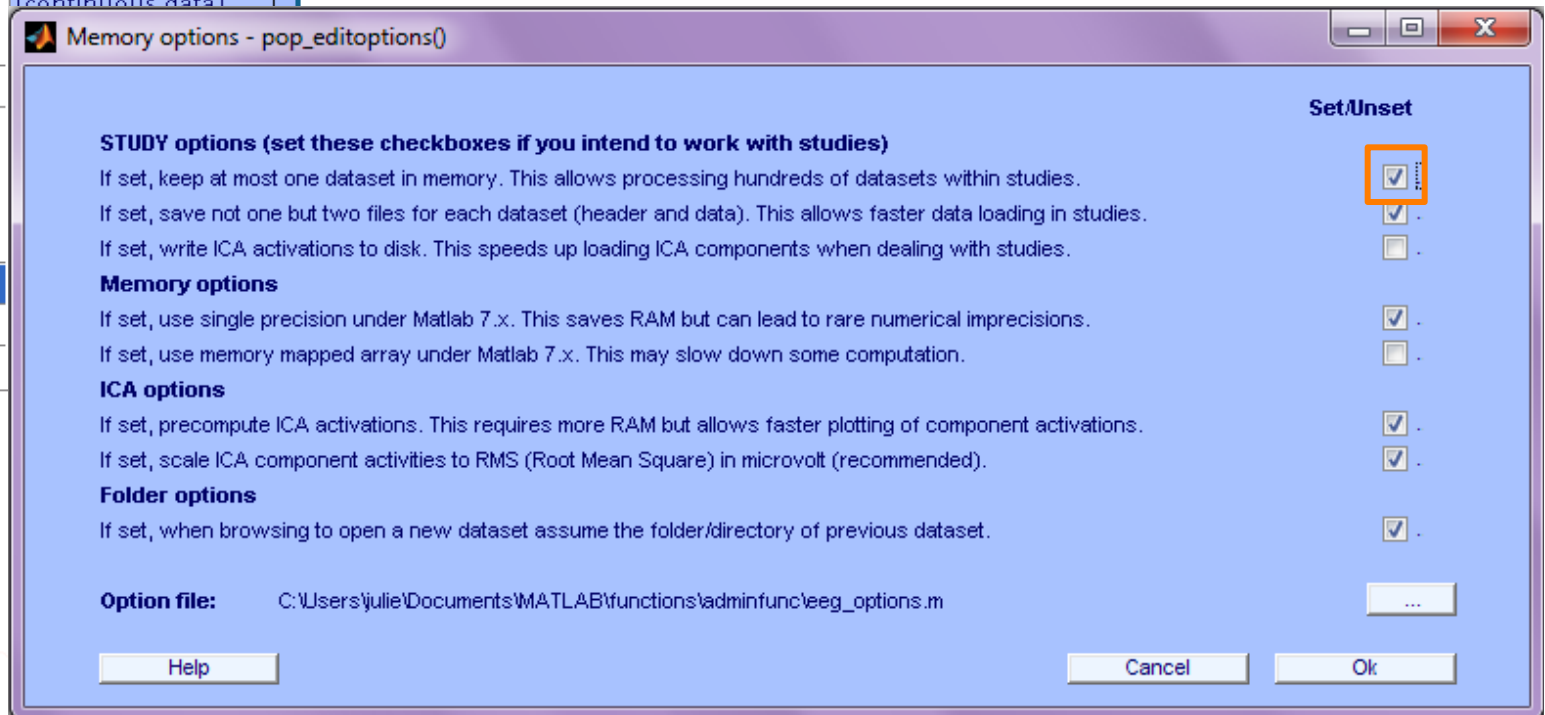
>> EEG.comments



# Memory options

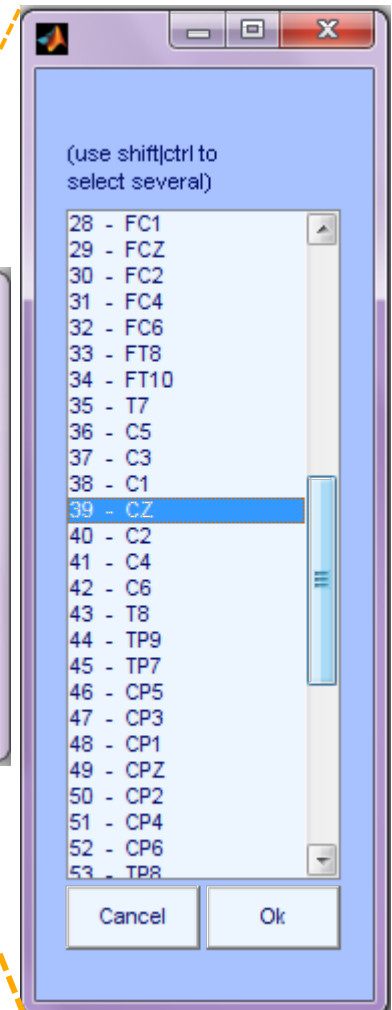
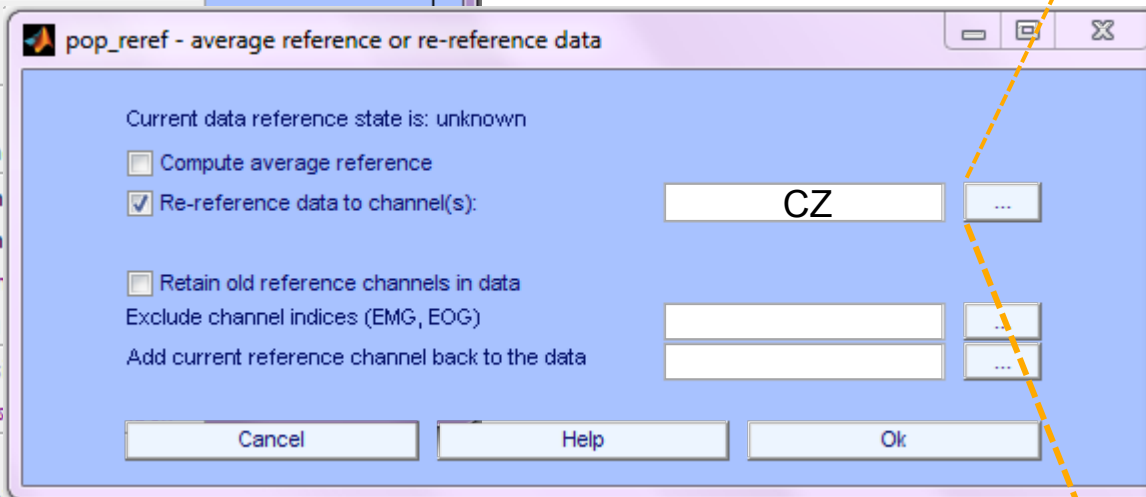
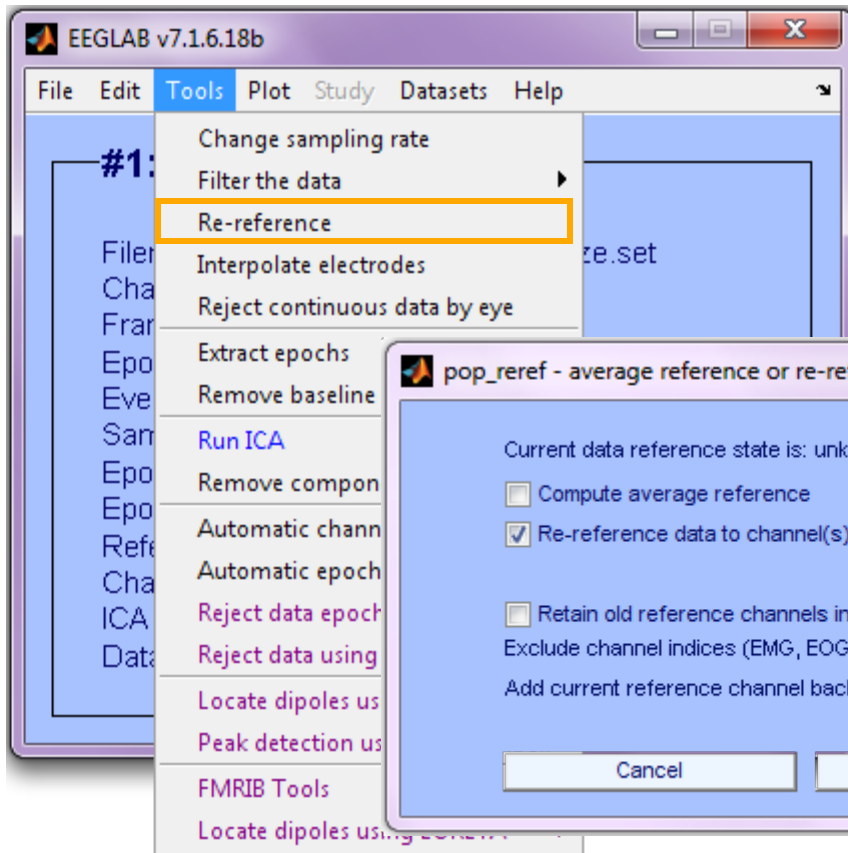
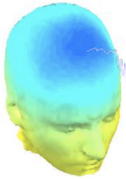


Set when loading a STUDY



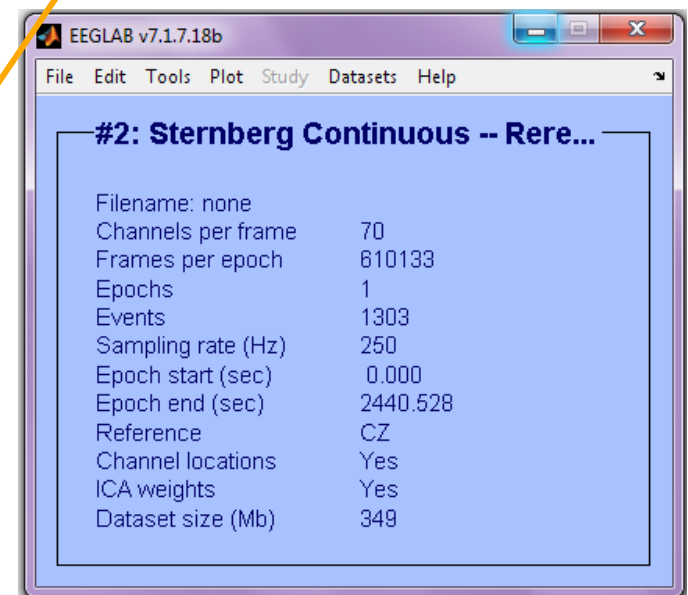
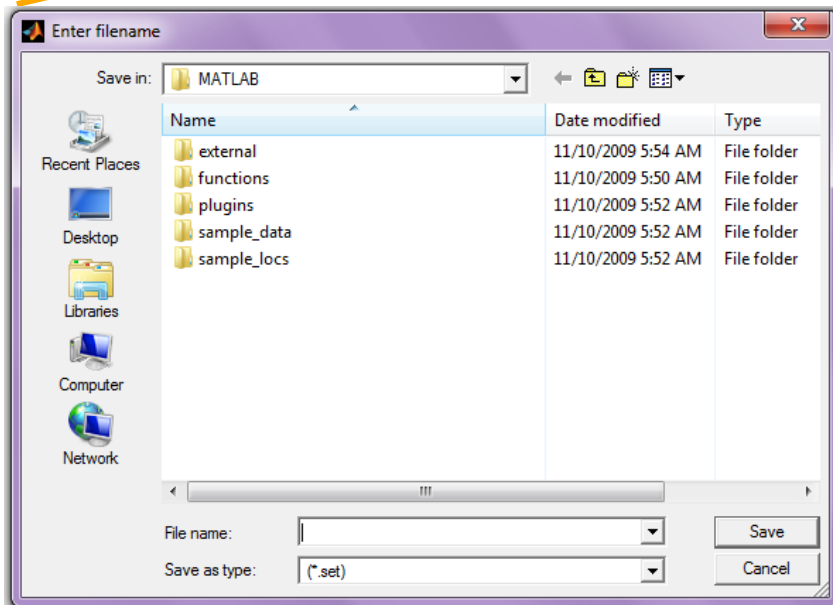
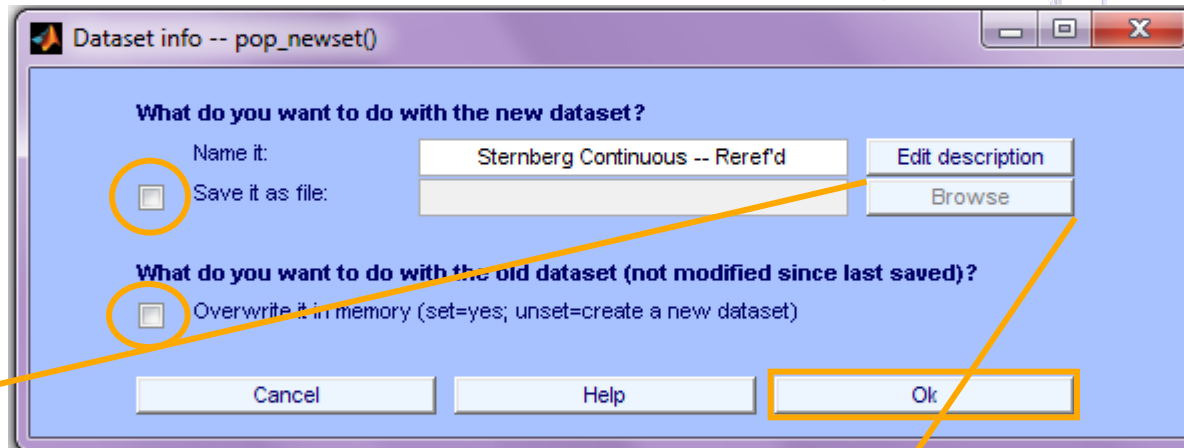
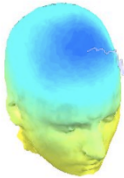


# Re-reference data (if necessary/desired)



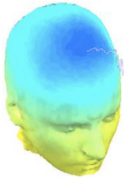
```
EEG = pop_reref( EEG, 39 );
```

# Save new dataset, keep old one



```
[ALLEEG EEG CURRENTSET] = pop_newset(ALLEEG,EEG, 1, 'setname',...  
'Sternberg Continuous -- Reref''d');
```

# Multiple active datasets (ALLEEG)



EEGLAB v7.1.6.18b

File Edit Tools Plot Study Datasets Help

**#1: Sternberg Continuous Data**

Filename: ...ustralia\STUDYS04stern.set

Channels per frame	71
Frames per epoch	610133
Epochs	1
Events	1303
Sampling rate (Hz)	250
Epoch start (sec)	0.000
Epoch end (sec)	2440.528
Reference	unknown
Channel locations	Yes
ICA weights	Yes
Dataset size (Mb)	698

EEGLAB v7.1.6.18b

File Edit Tools Plot Study Datasets Help

**#2: Sternberg C**

Filename: none

Channels per frame	70
Frames per epoch	610133
Epochs	1
Events	1303
Sampling rate (Hz)	250
Epoch start (sec)	0.000
Epoch end (sec)	2440.528
Reference	CZ
Channel locations	Yes
ICA weights	Yes
Dataset size (Mb)	693.1

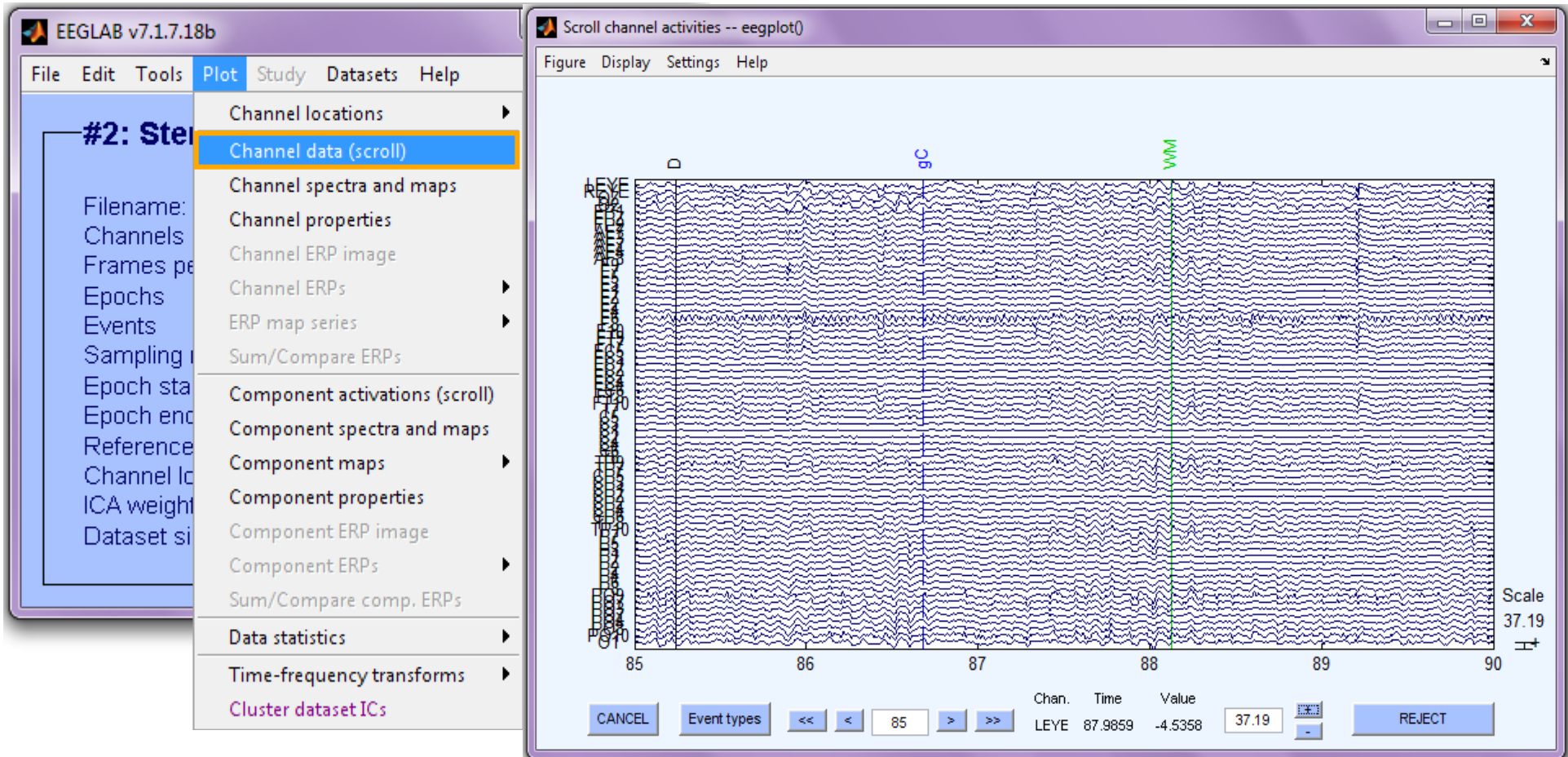
Dataset 1: Sternberg Continuous Data

✓ Dataset 2: Sternberg Continuous -- Reref'd

Select multiple datasets

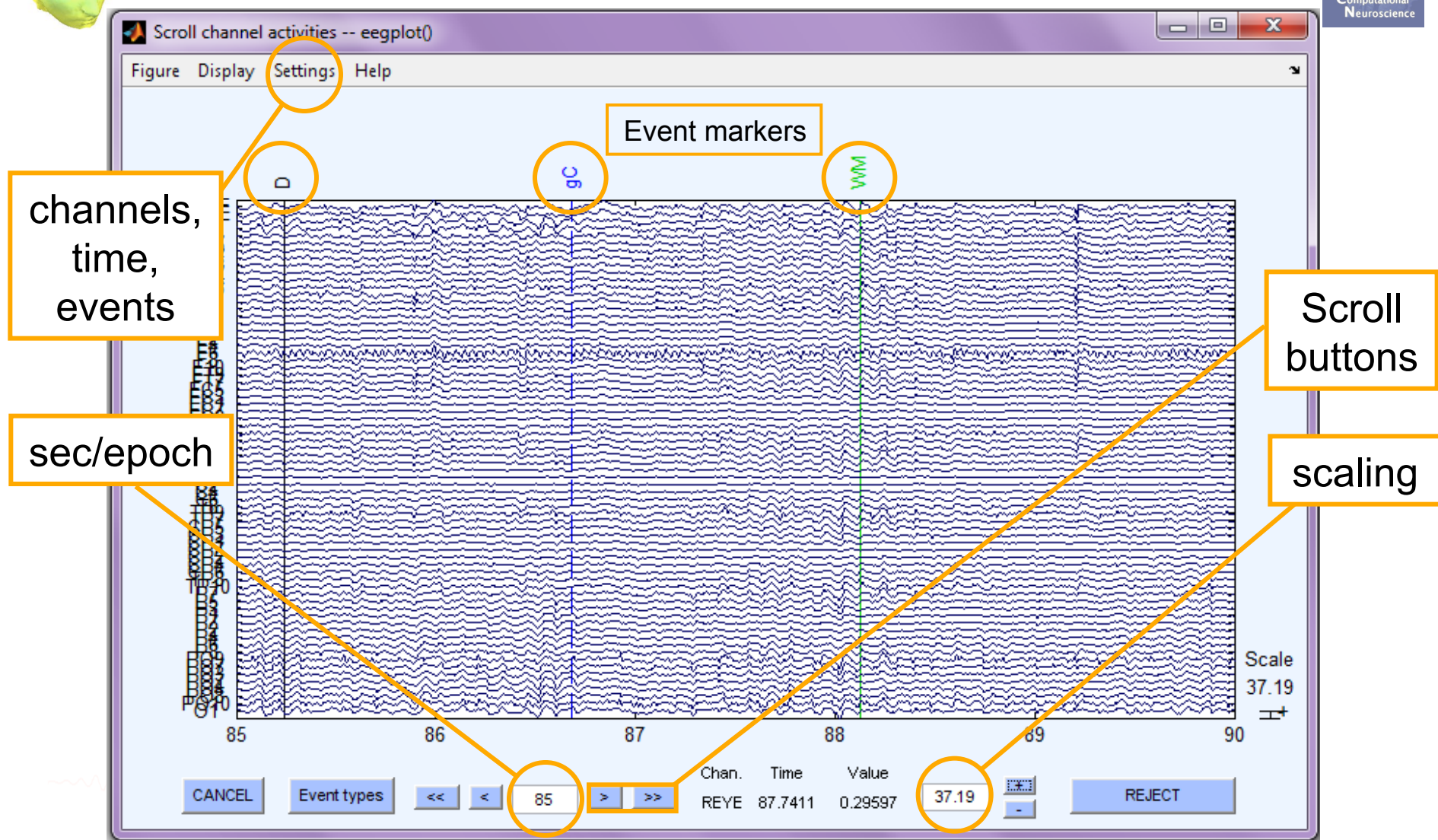
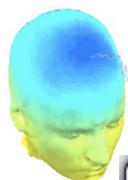


# Scroll channel data



```
>> pop_eegplot(EEG,1,1,1);
```

# Scroll channel data



# Data importing and channel analysis



## Task 1

- Import raw data
- Re-reference data
- Scroll channel data

## Task 2

- Import channel location file

## Task 3

- Import data events

## Task 4

- Extract data epochs
- Select epochs/events

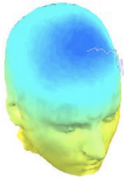
## Task 4

- Channel analysis

Exercise...



# Import channel locations



EEGLAB v7.1.7.18b

File Edit Tools Plot Study Datasets H

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)

70  
610133  
1  
1303  
250  
0.000  
2440.5  
CZ  
Yes  
Yes  
349

**Edit channel info -- pop\_chanedit()**

**Channel information ("field\_name"):**

Channel label ("label")	LEYE
Polar angle ("theta")	-45.1543
Polar radius ("radius")	0.54374
Cartesian X ("X")	0.79487
Cartesian Y ("Y")	0.79917
Cartesian Z ("Z")	-0.15585
Spherical horiz. angle ("sph_theta")	45.1543
Spherical azimuth angle ("sph_phi")	-7.8725
Spherical radius ("sph_radius")	1.1379
Channel type	
Reference	CZ
Index in backup 'urchanlocs' structure	
Channel in data array (set=yes)	<input checked="" type="checkbox"/>

Opt. head center  
Rotate axis  
Transform axes

XYZ -> polar & sph.  
Sph. -> polar & xyz  
Polar -> sph. & xyz

Set head radius  
Set channel types  
Set reference

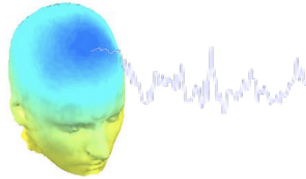
Delete chan  
Insert chan << < 1 > >> Append chan

Plot 2-D Plot radius (0.2-1, [=auto]) Nose along +X Plot 3-D (xyz)

Read locations Read locs help Look up locs Save (as .ced) Save (other types)

Cancel Help Ok

7 file formats supported  
(Polhemus, BESA, ...)



**Edit channel info -- pop\_chanedit()**

**Channel information ("field\_name"):**

Channel label ("label")

Polar angle ("theta")

Polar radius ("radius")

Cartesian X ("X")

Cartesian Y ("Y")

Cartesian Z ("Z")

Spherical horiz. angle ("sph\_theta")

Spherical azimuth angle ("sph\_phi")

Spherical radius ("sph\_radius")

Channel type

Reference

Index in backup 'urchanlocs' structure

Channel in data array (set=yes)

Buttons: Opt. head center, Rotate axis, Transform axes, Xyz -> polar & sph., Sph. -> polar & xyz, Polar -> sph. & xyz, Set head radius, Set channel types, Set reference

LEYE
-45.1543
0.54374
0.79487
0.79917
-0.15585
45.1543
-7.8725
1.1379
EEG
CZ

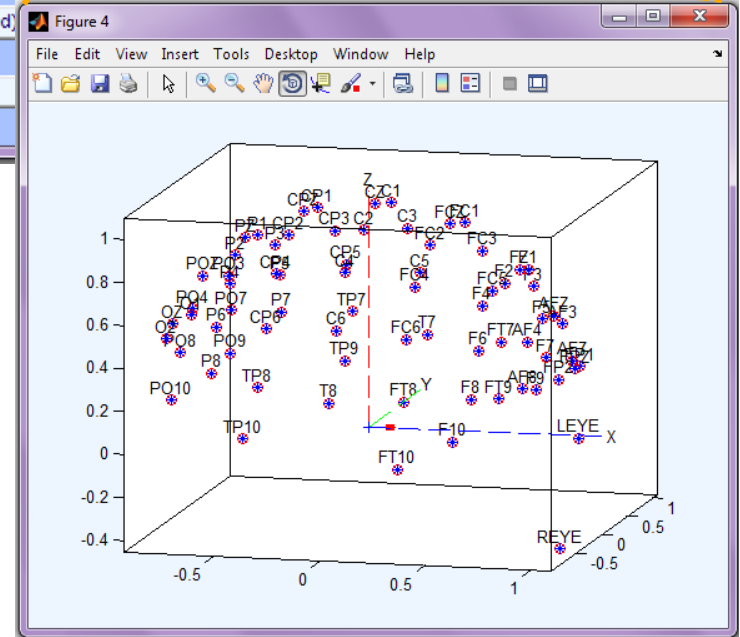
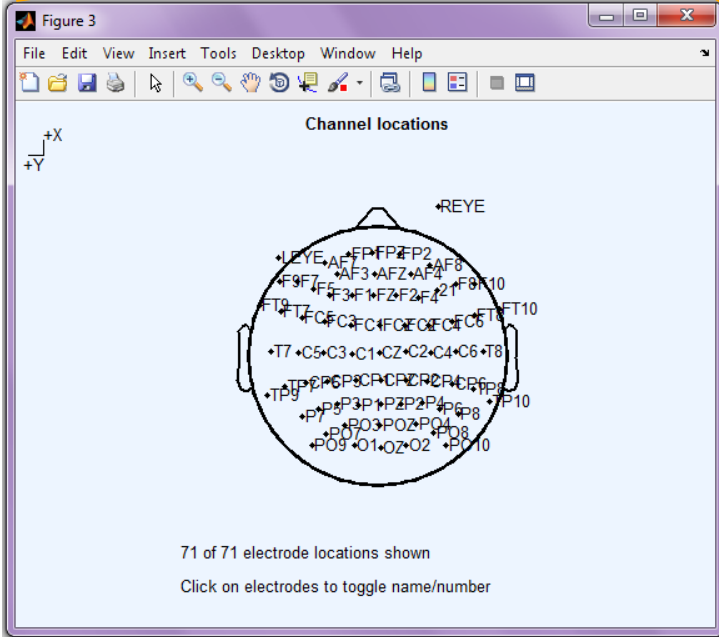
Buttons: Delete chan, Insert chan, Channel number (of 71) [1], Append chan, Plot 2-D, Plot radius (0.2-1, []=auto), Nose along +X, Plot 3-D (xyz)

**Set channel type**

Channel indices: 1:33

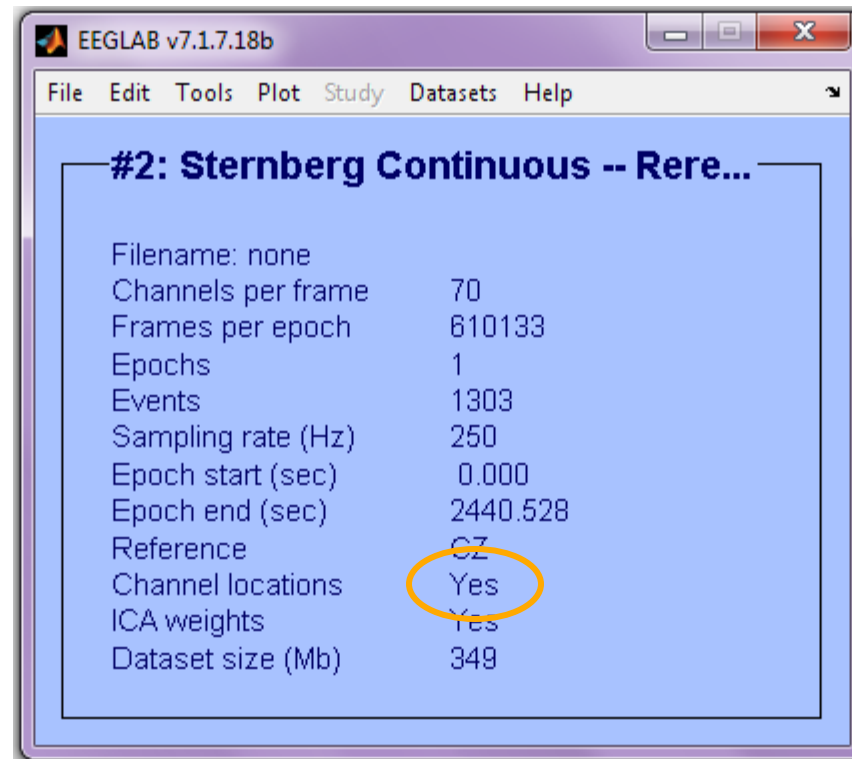
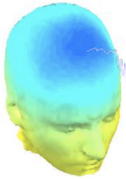
Type (e.g. EEG): EEG

Buttons: Cancel, Help, Ok

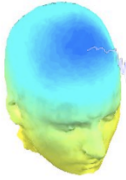




# Imported channel locations



# Data importing and channel analysis



## Task 1

- Import raw data
- Re-reference data
- Scroll channel data

## Task 2

- Import channel location file

## Task 3

- Import data events

## Task 4

- Extract data epochs
- Select epochs/events

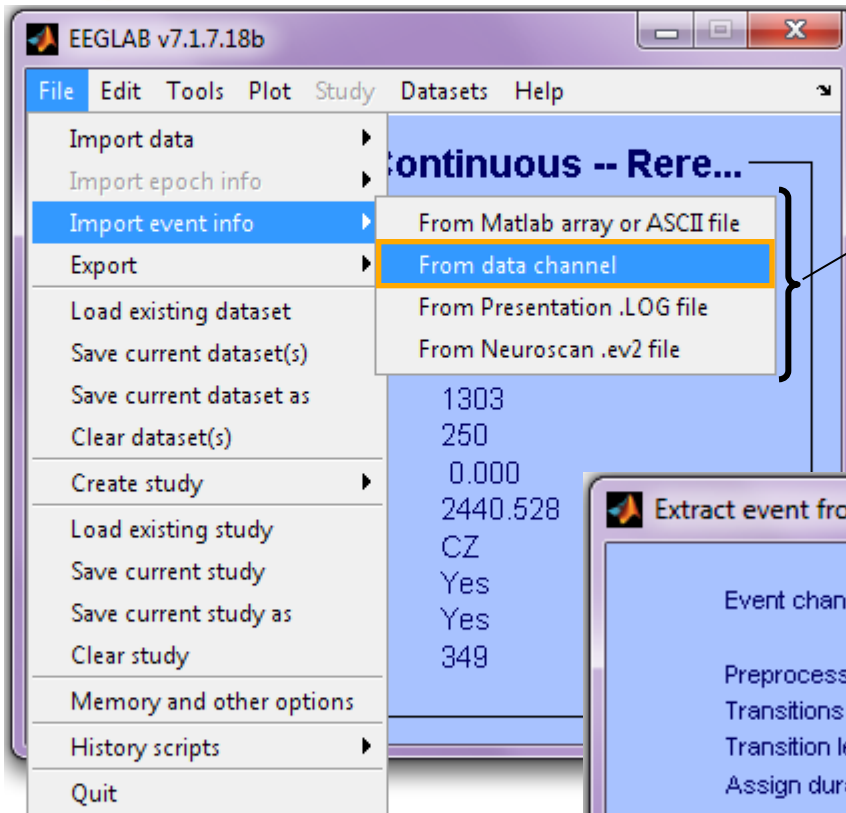
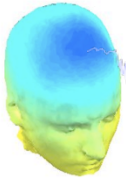
## Task 4

- Channel analysis

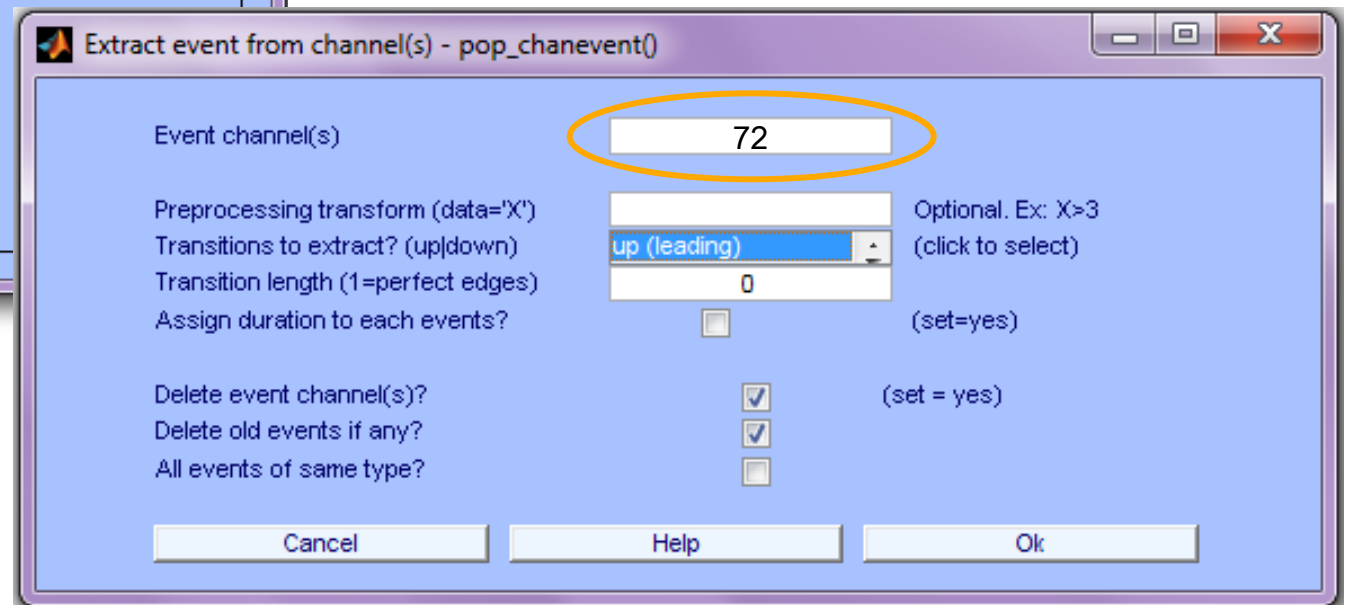
Exercise...



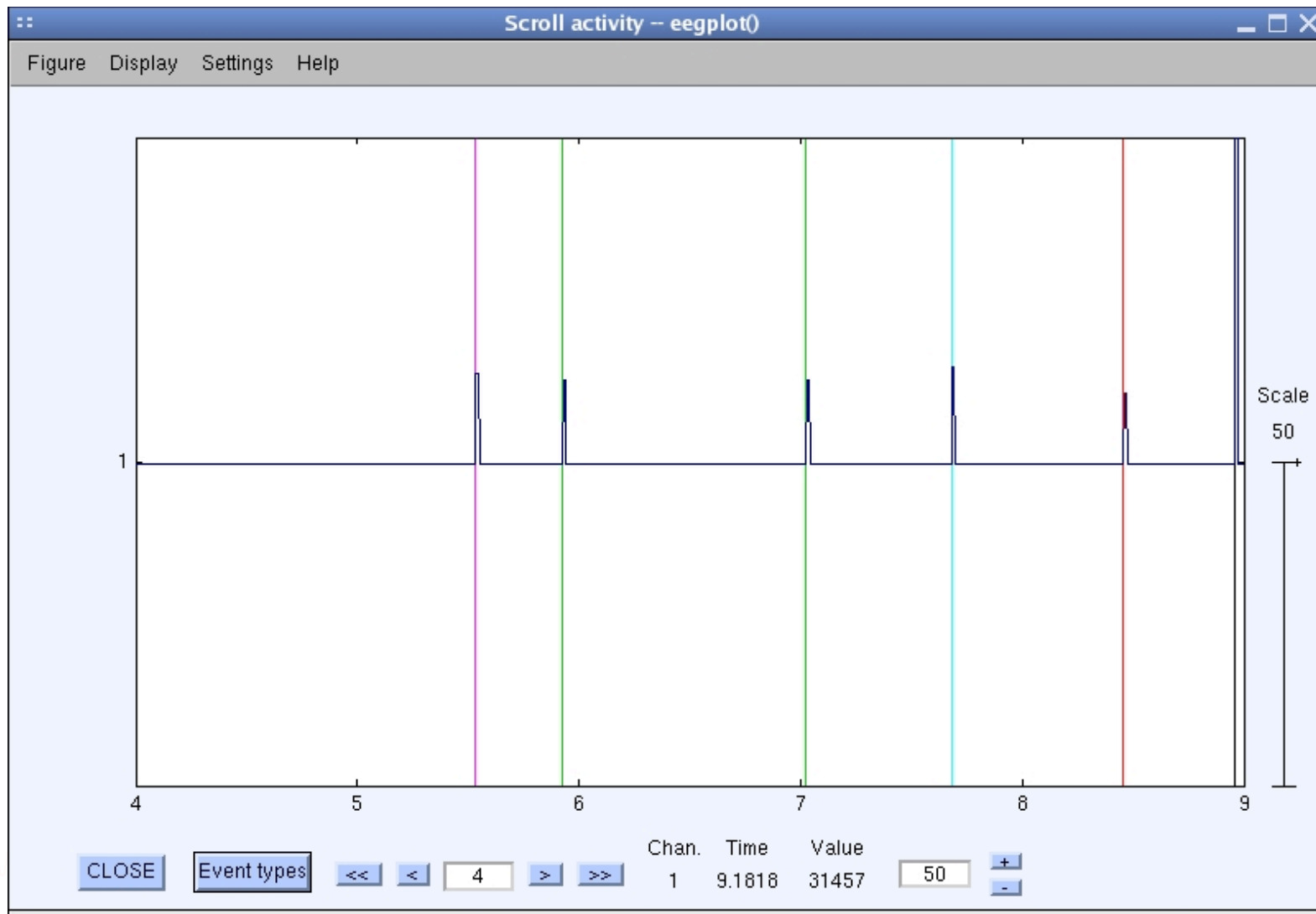
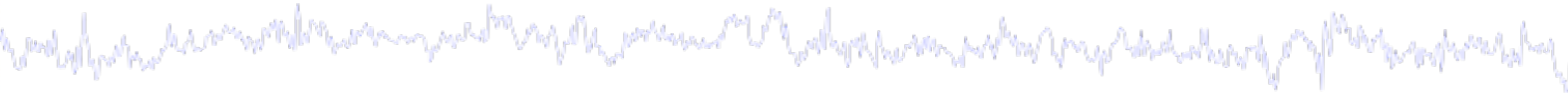
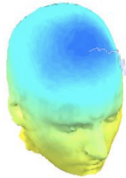
# Import data events



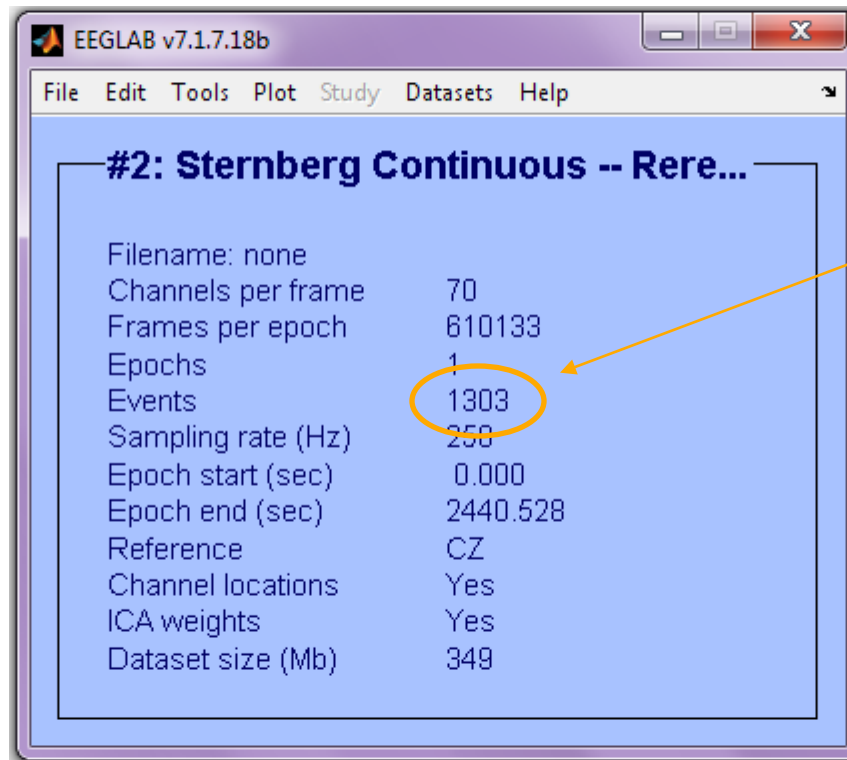
- Import events from Matlab array or ASCII file
- **Import events from data channel**
- Import from Presentation event file
- Import from Neuroscan file



# Appearance of an event channel



# Imported data events



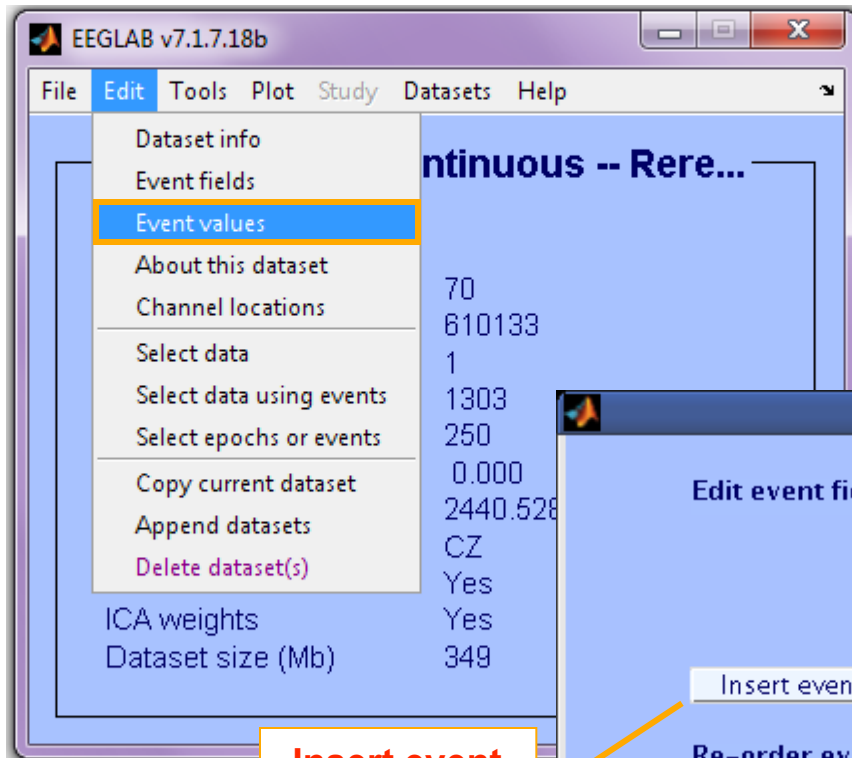
If event import was successful, you will see an appropriate number here



# Review event values

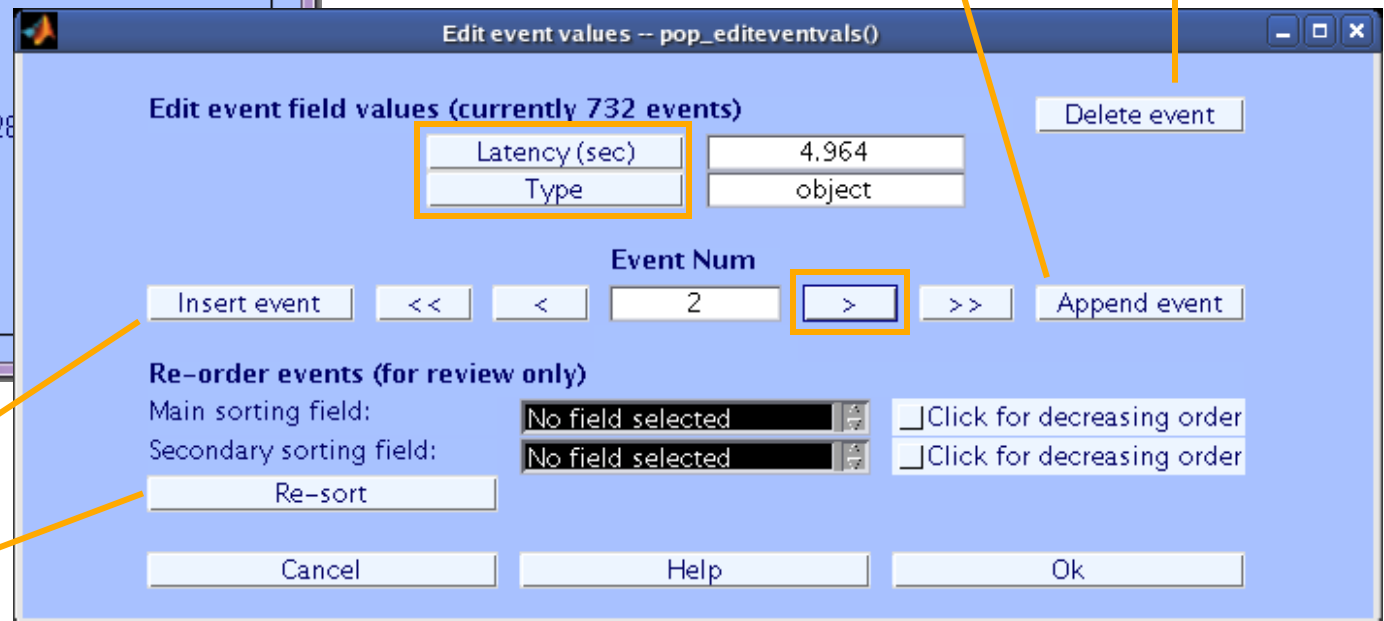


Event 'type' and 'latency' are recognized fields



Append event AFTER current event

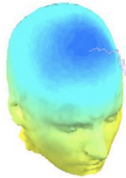
Delete CURRENT event



Insert event BEFORE current event

To resort: first select Main sorting field

# Review event values



EEGLAB v7.1.7.18b

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)

Continuous -- Rere...

70  
610133  
1  
1303  
250  
0.000  
2440.528  
CZ  
Yes  
Yes  
349

Edit event values -- pop\_editeventvals()

Edit event field values (currently 1303 events) Delete event

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

**Number of event fields is unlimited**

Event Num

Insert event << < 1 > >> Append event

Re-order events (for review only)

Main sorting field:   Click for decreasing order

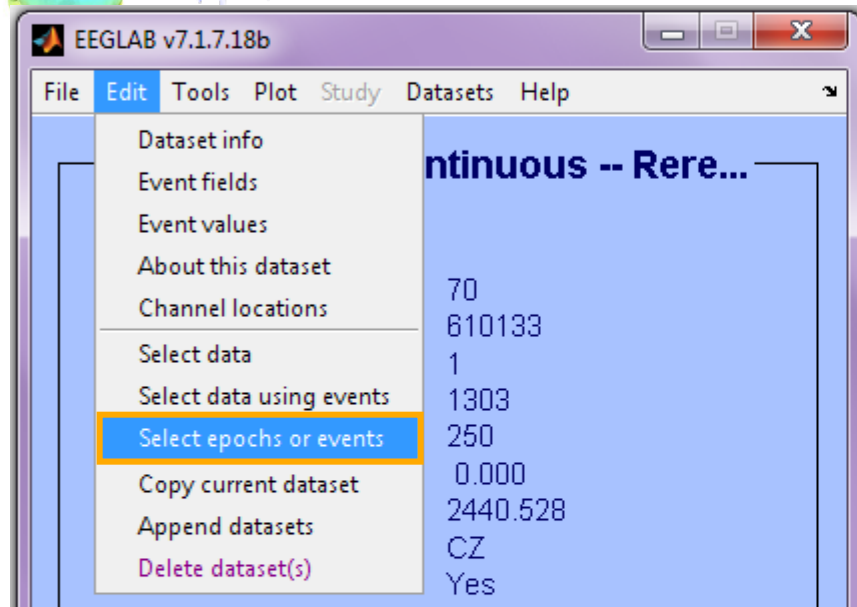
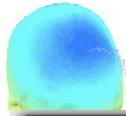
Secondary sorting field:   Click for decreasing order

Re-sort

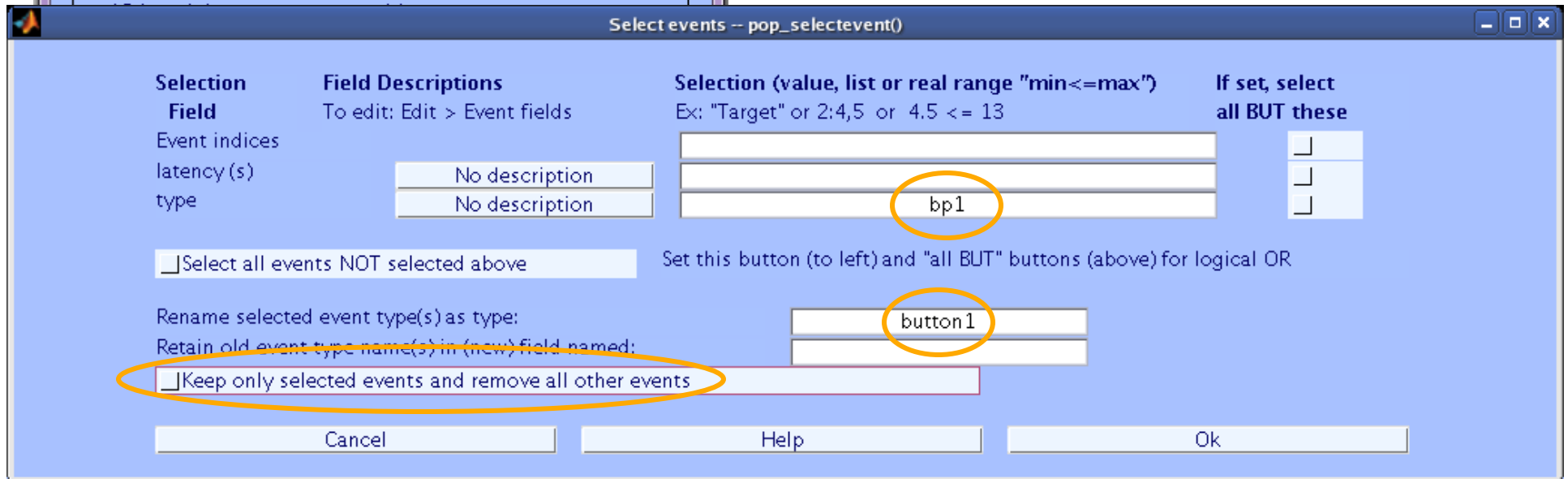
Cancel Help Ok



# Renaming events

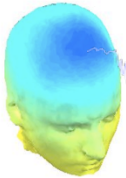


- 1) input original 'type' code
- 2) input new 'type' code
- 3) Keep/delete all other events





# Renaming events



EEGLAB v7.1.7.18b

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)

ntinuous -- Rere...

70  
610133  
1  
1303  
250  
0.000  
2440.528  
CZ  
Yes  
Yes  
349

Edit event values -- pop\_editeventvals()

Edit event field values (currently 732 events) Delete event

Latency (sec) 5.724  
Type button1

Event Num  
Insert event << < 3 > >> Append event

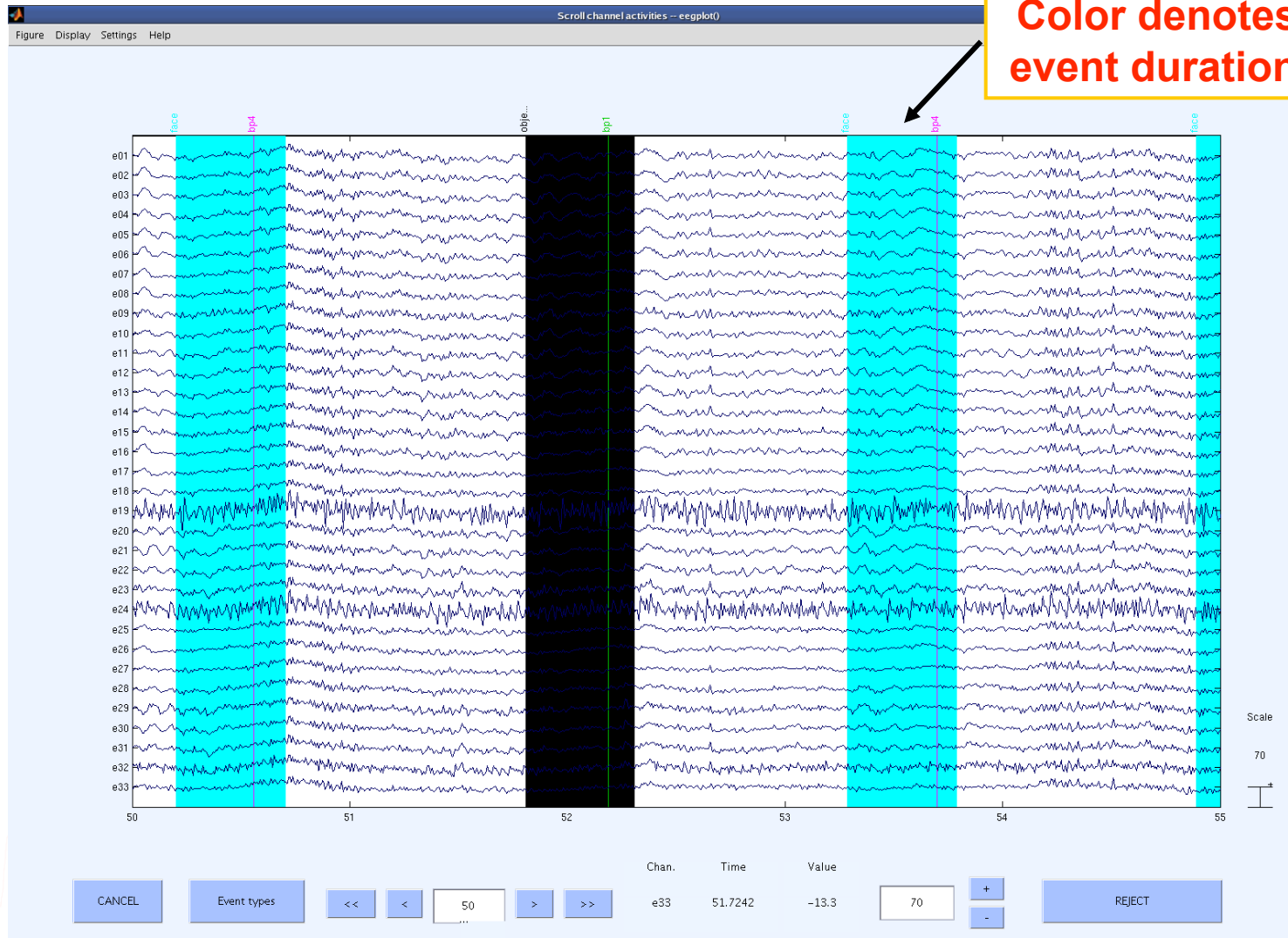
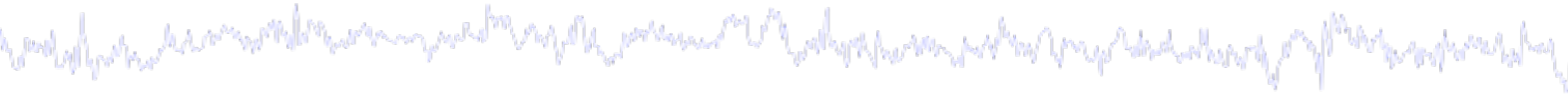
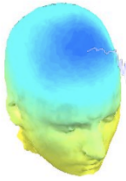
Re-order events (for review only)  
Main sorting field: No field selected  Click for decreasing order  
Secondary sorting field: No field selected  Click for decreasing order

Re-sort

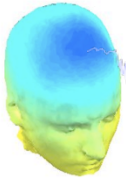
Cancel Help Ok



# Event durations



# Data importing and channel analysis



## Task 1

- Import raw data
- Re-reference data
- Scroll channel data

## Task 2

- Import channel location file

## Task 3

- Import data events

## Task 4

- Extract data epochs
- Select epochs/events

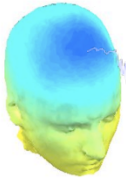
## Task 4

- Channel analysis

Exercise...



# Extract epochs



EEGLAB v7.1.7.18b

File Edit **Tools** Plot Study Datasets Help

- Change sampling rate
- Filter the data
- Re-reference
- Interpolate electrodes
- Reject continuous data by eye
- Extract epochs**
- Remove baseline
- Run ICA
- Remove components
- Automatic channel rejection
- Automatic epoch rejection
- Reject data epochs
- Reject data using ICA
- Locate dipoles using DIPFIT 2.x
- Peak detection using EEG toolbox
- FMRIB Tools
- Locate dipoles using LORETA

**Extract data epochs - pop\_epoch()**

Time-locking event type(s) ([])= ...

Epoch limits [start, end] in seconds:

Name for the new dataset:

Out-of-bounds EEG limits if any [min max]:

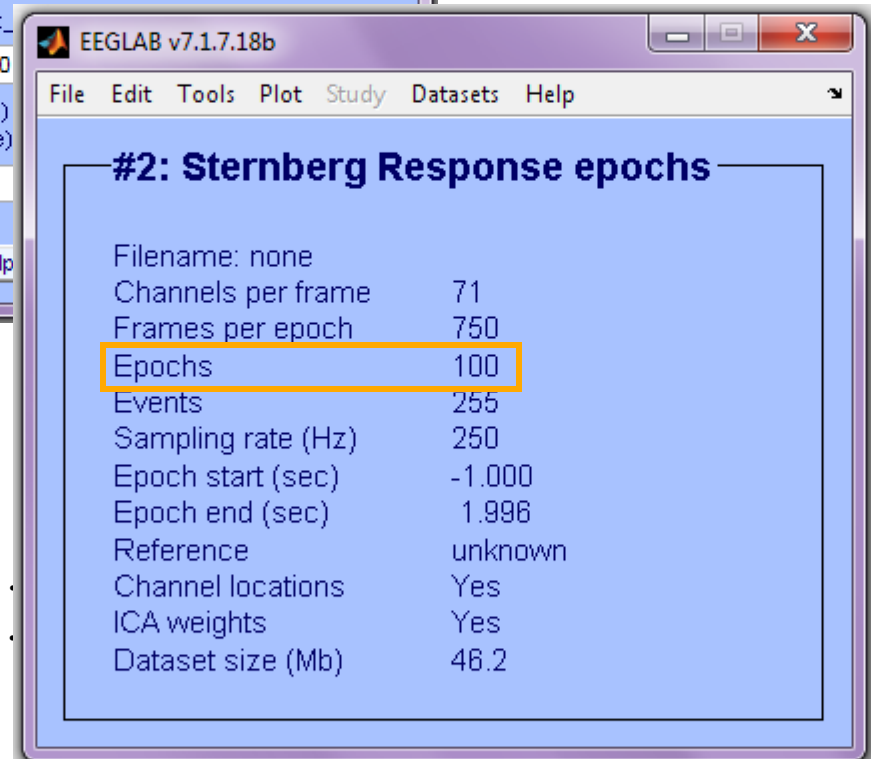
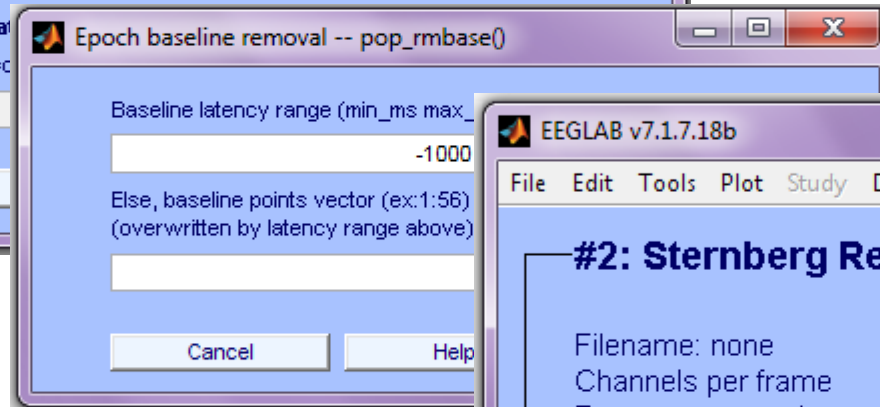
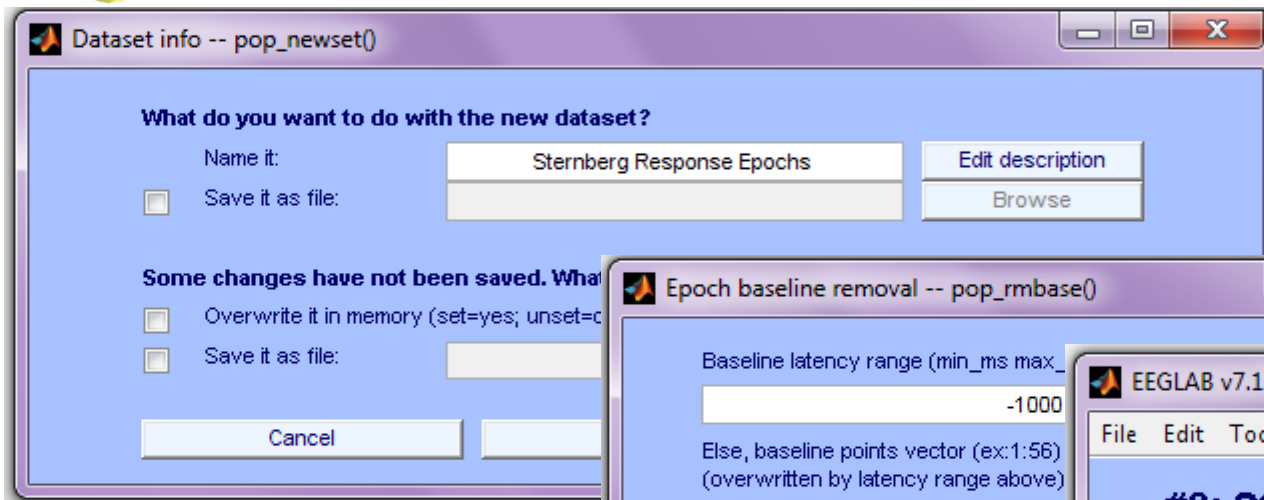
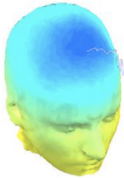
Cancel Help Ok

(use shift|ctrl to select several)

- 1
- 255
- B
- C
- D
- F
- G
- H
- J
- K
- L
- M
- N
- P
- Q
- R
- S
- T
- V
- W
- WM
- X
- Y
- Z
- boundary
- αB

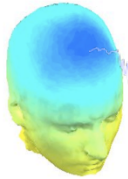
Cancel Ok

# Extract epochs



```
EEG = pop_epoch ( EEG, {'out', 'in' },...  
  [-1 2], 'newname',...  
  'Sternberg Continuous -- Reref'd epochs',...  
  'epochinfo', 'yes');  
[ALLEEG EEG CURRENTSET] = pop_newset(ALLEEG,...  
  EEG, 2, 'setname', 'Sternberg Response Epochs',...  
  'gui', 'off');  
EEG = pop_rmbase ( EEG, [-1000 0]);
```

# Select epochs



EEGLAB v7.1.7.18b

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)

71  
750  
100  
255  
250  
-1.000  
1.996  
unknown  
Yes  
Yes  
46.2

## Response Epochs

Select events -- pop\_selectevent()

Field	Selection	Set=NOT THESE
latency (ms)	No description min 0 max 0	<input type="checkbox"/>
duration (ms)	No description min max	<input type="checkbox"/>
type	No description 'in' ...	<input type="checkbox"/>
Trial	No description	<input type="checkbox"/>
Event_Type	No description	<input type="checkbox"/>
TTime	No description	<input type="checkbox"/>
Uncertainty	No description	<input type="checkbox"/>
Duration	No description	<input type="checkbox"/>
Uncertainty2	No description	<input type="checkbox"/>
ReqTime	No description	<input type="checkbox"/>
ReqDur	No description	<input type="checkbox"/>
init_index	No description	<input type="checkbox"/>
init_time	No description	<input type="checkbox"/>
load	No description	<input type="checkbox"/>
epoch	No description	<input type="checkbox"/>
Event indices		<input type="checkbox"/>

Select all events NOT selected above Set this button (to left) and "all BUT" buttons (above) for logical OR

Rename selected event type(s) as type:

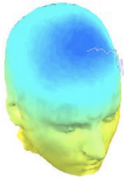
Retain old event type name(s) in (new) field named:

Keep only selected events and remove all other events  
 **Remove epochs not referenced by any selected event**  
 Invert epoch selection

Cancel Help Ok

```
>> EEG = pop_selectevent(EEG, 'type', { 'in' }, ...  
    'deleteevents', 'off', 'deleteepochs', 'on');  
>> [ALLEEG EEG CURRENTSET] = pop_newset(ALLEEG, EEG, 4, ...  
    'setname', 'faces only epochs');
```

# Select epochs with specific events



EEGLAB v7.2.7.18b

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)

Field	Description	min	Selection	max	Set=NOT THESE
latency (ms)	No description	min	0	max 5000	<input type="checkbox"/>
duration (ms)	No description	min		max	<input type="checkbox"/>
type	No description		'in'	...	<input type="checkbox"/>
Trial	No description				<input type="checkbox"/>
Event_Type	No description				<input type="checkbox"/>
TTime	No description				<input type="checkbox"/>
Uncertainty	No description				<input type="checkbox"/>
Duration	No description				<input type="checkbox"/>
Uncertainty2	No description				<input type="checkbox"/>
ReqTime	No description				<input type="checkbox"/>
ReqDur	No description				<input type="checkbox"/>
init_index	No description				<input type="checkbox"/>
init_time	No description				<input type="checkbox"/>
load	No description				<input type="checkbox"/>
epoch	No description				<input type="checkbox"/>
Event indices	No description				<input type="checkbox"/>

**Event selection**

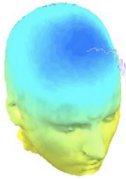
- Select all events NOT selected above (Set this button and "all BUT" buttons (above) for logical OR)
- Keep only selected events and remove all other events
- rename selected event type(s) as type:
- retain old event type name(s) in (new) field named:
- selection
- Remove epochs not referenced by any selected event
- Invert epoch selection

Warning: delete 44 (out of 100) un-referenced epochs ?

Cancel Ok

Help Cancel Ok

# Repeat for 'out-of-set' responses



Save without overwriting and go back to all epochs

Repeat process for 'out' trials



**Dataset info -- pop\_newset()**

What do you want to do with the new dataset?

Name it: Sternberg: Probe- In Set

Save it as file:

Some changes have not been saved. What do you want to do with the old dataset?

Overwrite it in memory (set=yes; unset=create a new dataset)

Save it as file: C:\Users\julie\Documents\Workshops\Aust

Help

**Select events -- pop\_selectevent()**

Field	Description	min	max	Selection	Set=NOT THESE
latency (ms)	No description	0	5000		<input type="checkbox"/>
duration (ms)	No description				<input type="checkbox"/>
type	No description			'out'	<input type="checkbox"/>
Trial	No description				<input type="checkbox"/>
Event_Type	No description				<input type="checkbox"/>
TTime	No description				<input type="checkbox"/>
Uncertainty	No description				<input type="checkbox"/>
Duration	No description				<input type="checkbox"/>
Uncertainty2	No description				<input type="checkbox"/>
ReqTime	No description				<input type="checkbox"/>
ReqDur	No description				<input type="checkbox"/>
init_index	No description				<input type="checkbox"/>
init_time	No description				<input type="checkbox"/>

is button and "all BUT" buttons (above) for logical OR

her events

ned:

ted event

Cancel Ok

**Dataset info -- pop\_newset()**

What do you want to do with the new dataset?

Name it: Sternberg: Probe Out of Set

Save it as file:

Some changes have not been saved. What do you want to do with the old dataset?

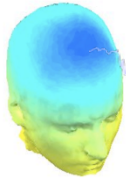
Overwrite it in memory (set=yes; unset=create a new dataset)

Save it as file: C:\Users\julie\Documents\Workshops\Aust

Help Cancel Ok



# Separate datasets with different conditions



EEGLAB v7.2.7.18b

File Edit Tools Plot Study Datasets Help

**#1: Sternberg: Probe Out of Set**

Filename:	...ps\Australia\Data\stern.set
Channels per frame	71
Frames per epoch	1500
Epochs	44
Events	154
Sampling rate (Hz)	250
Epoch start (sec)	-1.000
Epoch end (sec)	4.996
Reference	unknown
Channel locations	Yes
ICA weights	Yes
Dataset size (Mb)	40.7

EEGLAB v7.2.7.18b

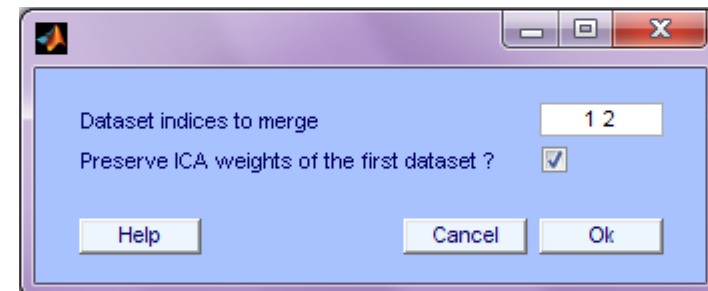
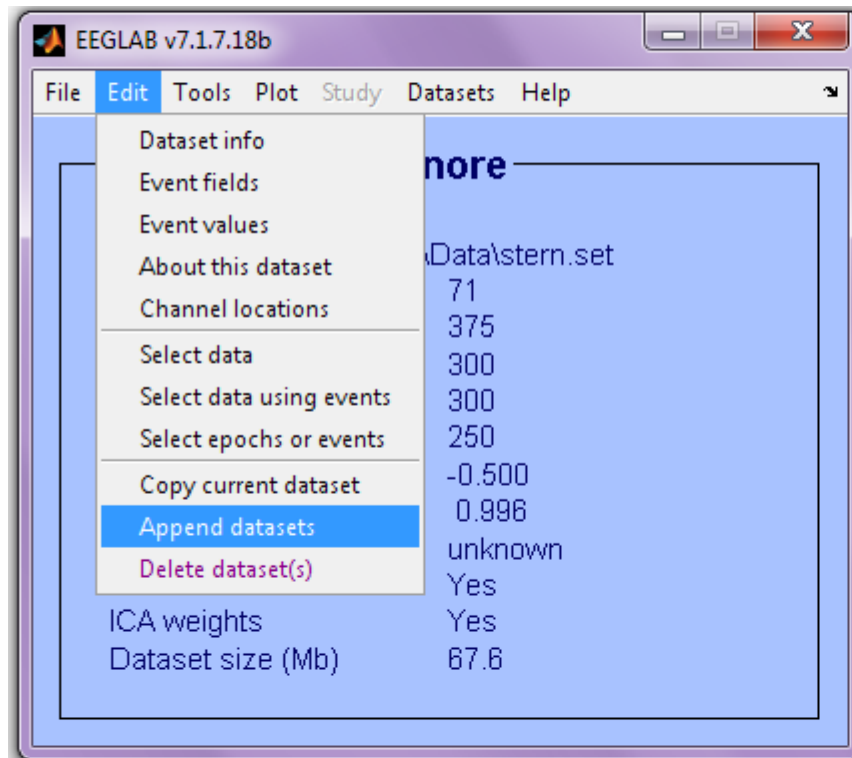
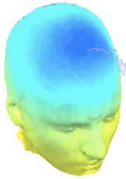
File Edit Tools Plot Study Datasets Help

**#2: Sternberg: Probe- In Set**

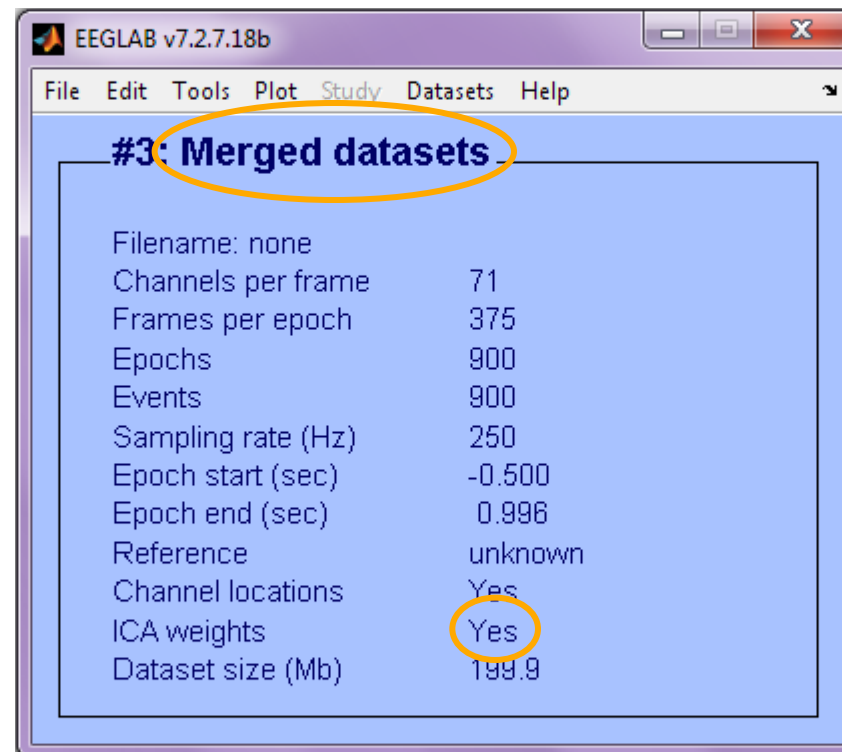
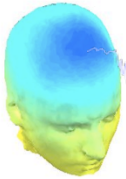
Filename:	none
Channels per frame	71
Frames per epoch	1500
Epochs	56
Events	192
Sampling rate (Hz)	250
Epoch start (sec)	-1.000
Epoch end (sec)	4.996
Reference	unknown
Channel locations	Yes
ICA weights	Yes
Dataset size (Mb)	51.1



# Merge (append) datasets



# Merged datasets



# Data importing and channel analysis



## Task 1

- Import raw data
- Re-reference data
- Scroll channel data

## Task 2

- Import channel location file

## Task 3

- Import data events

## Task 4

- Extract data epochs
- Select epochs/events

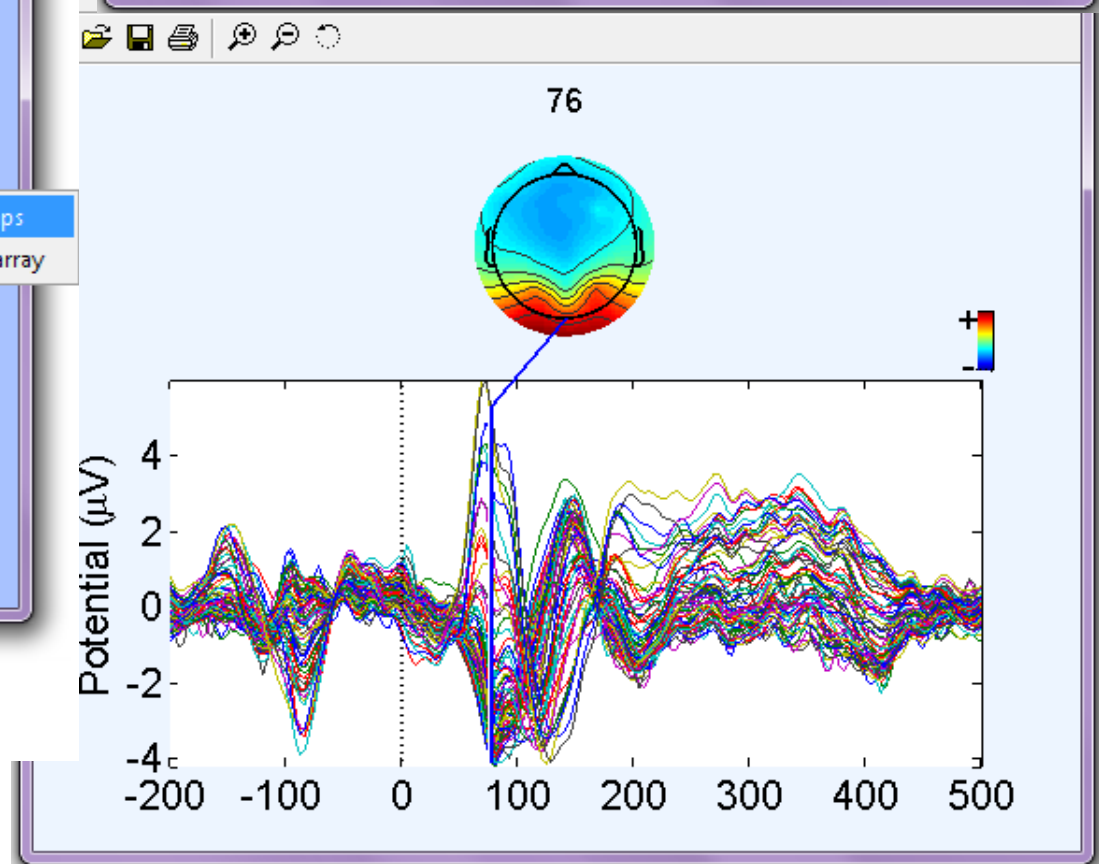
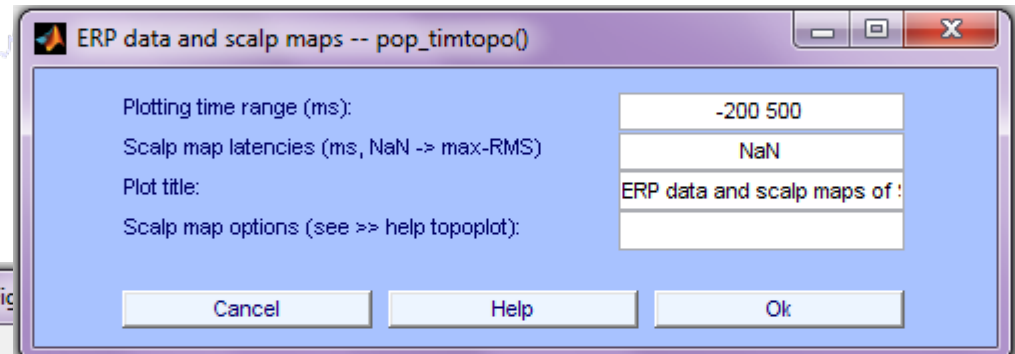
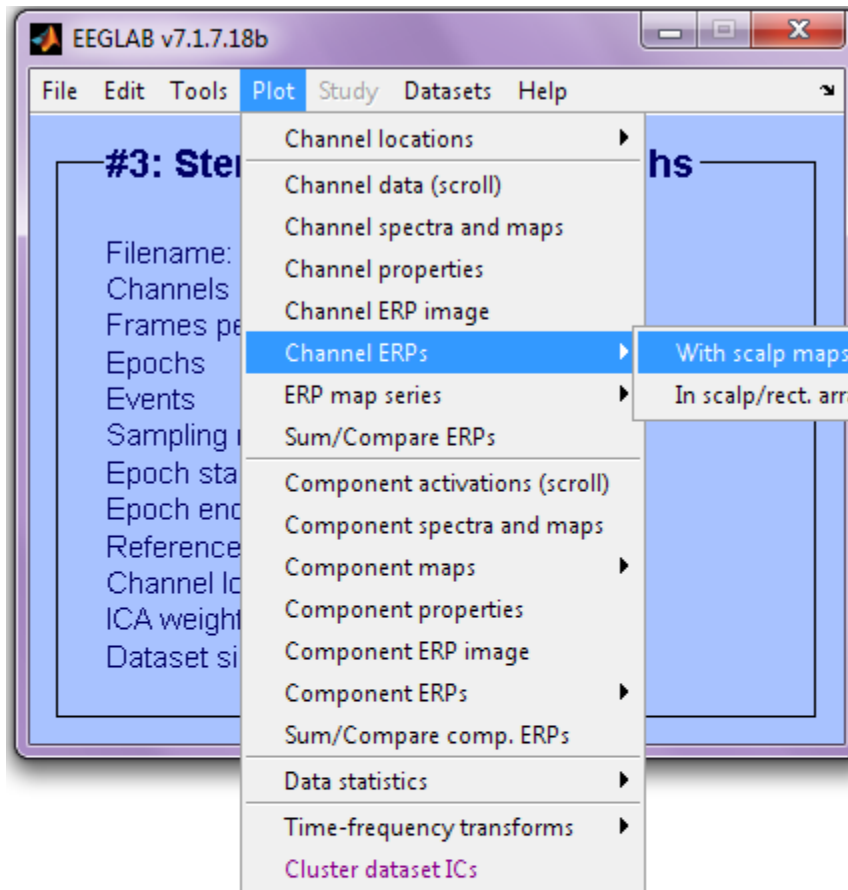
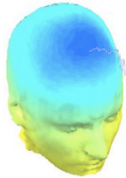
## Task 4

- Channel analysis

[Exercise...](#)

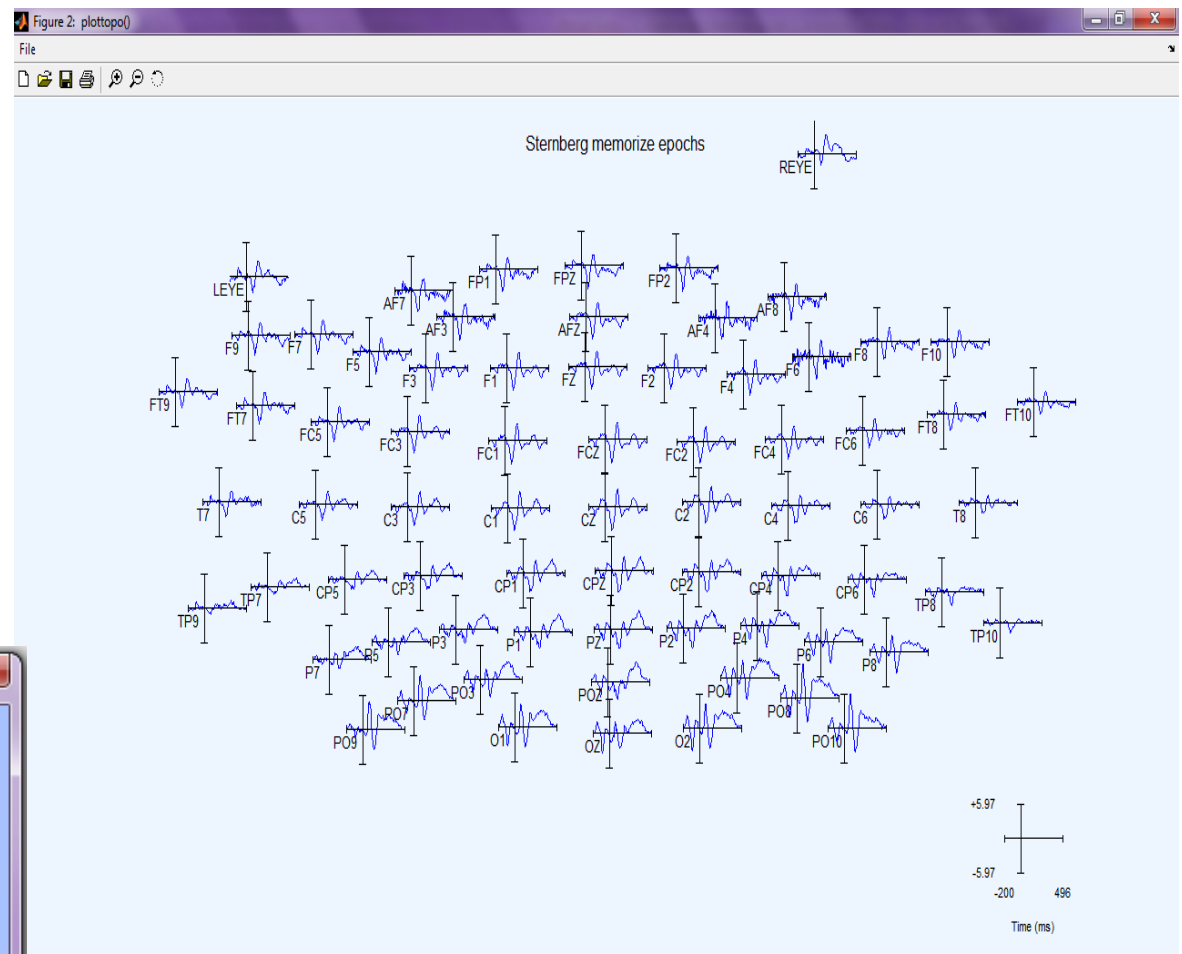
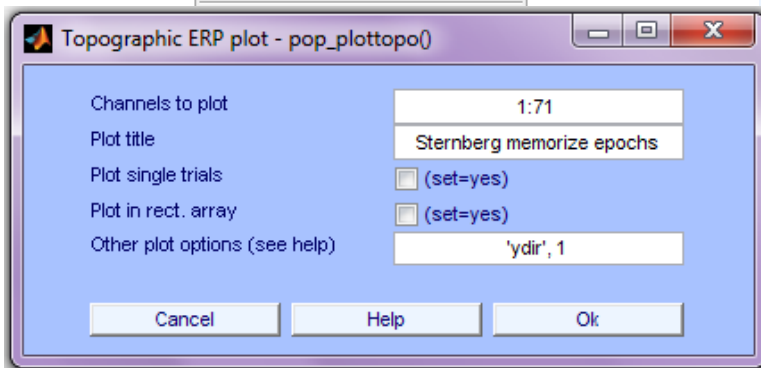
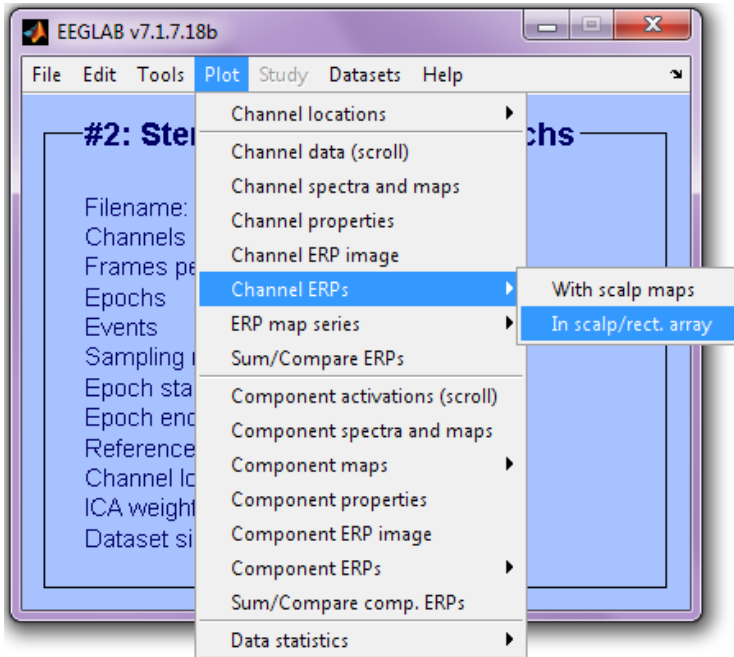


# Analysis of ERPs

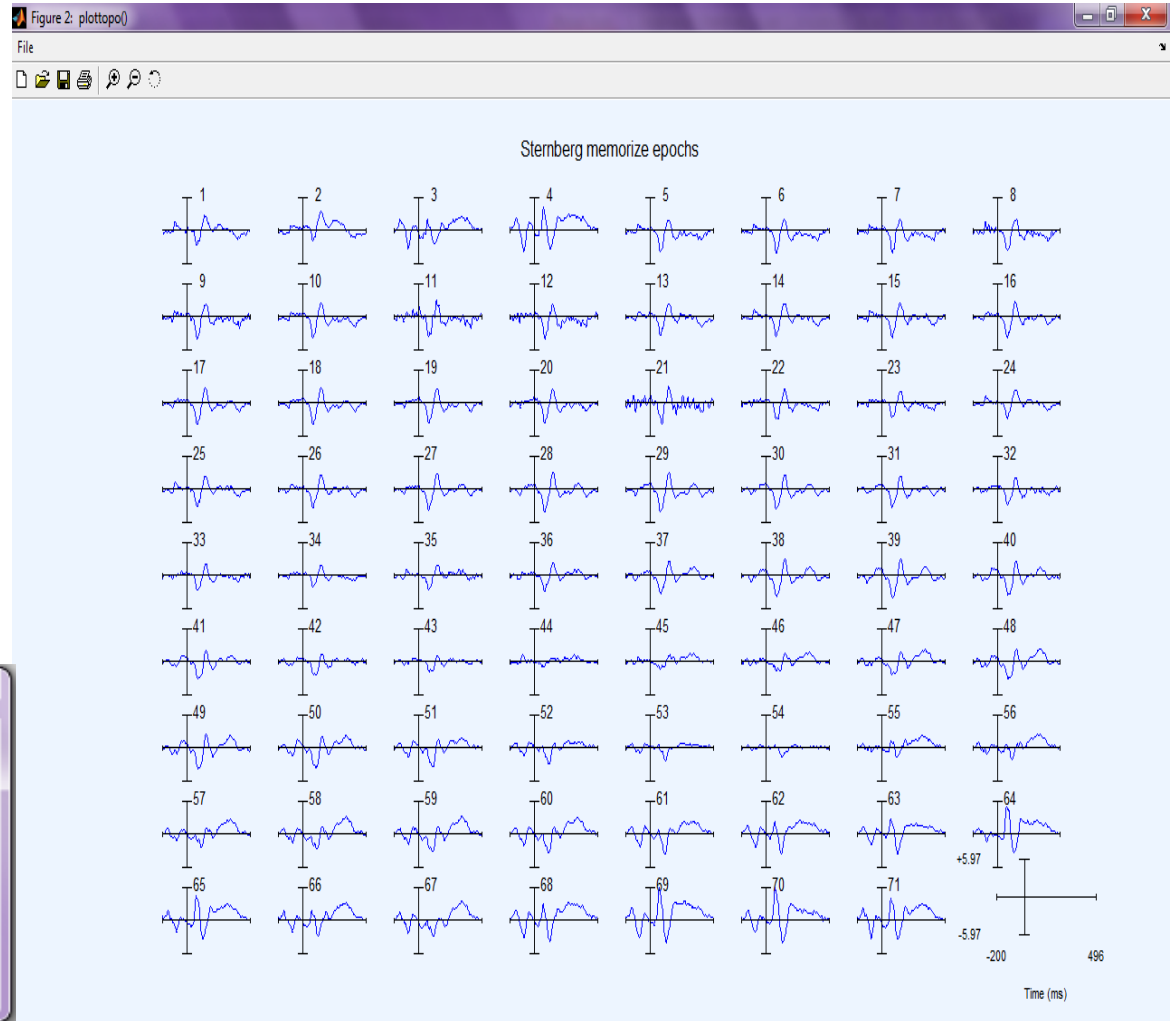
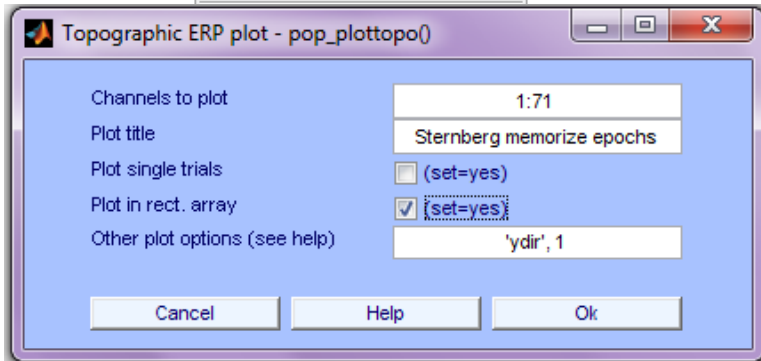
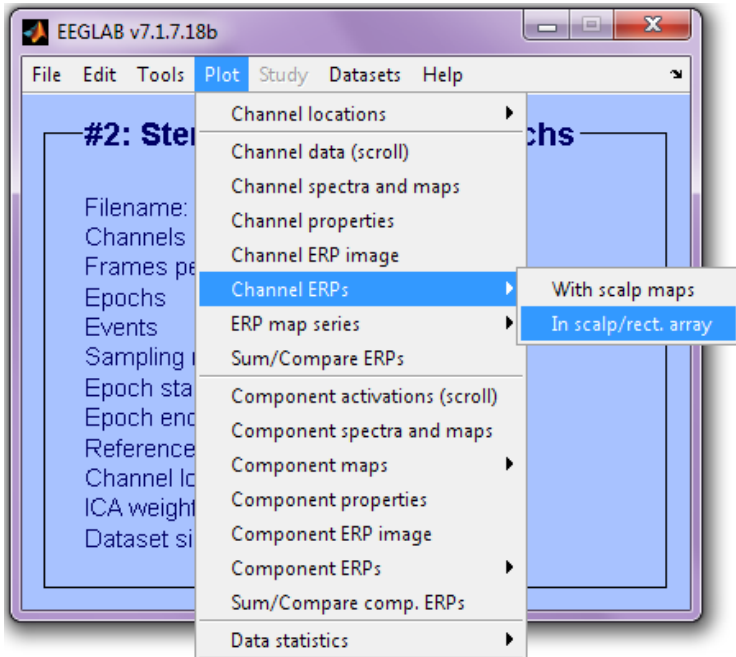
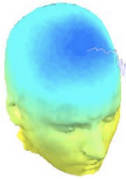


```
>> pop_timtopo(EEG, [-200 500], [NaN], 'ERP data and scalp maps');
```

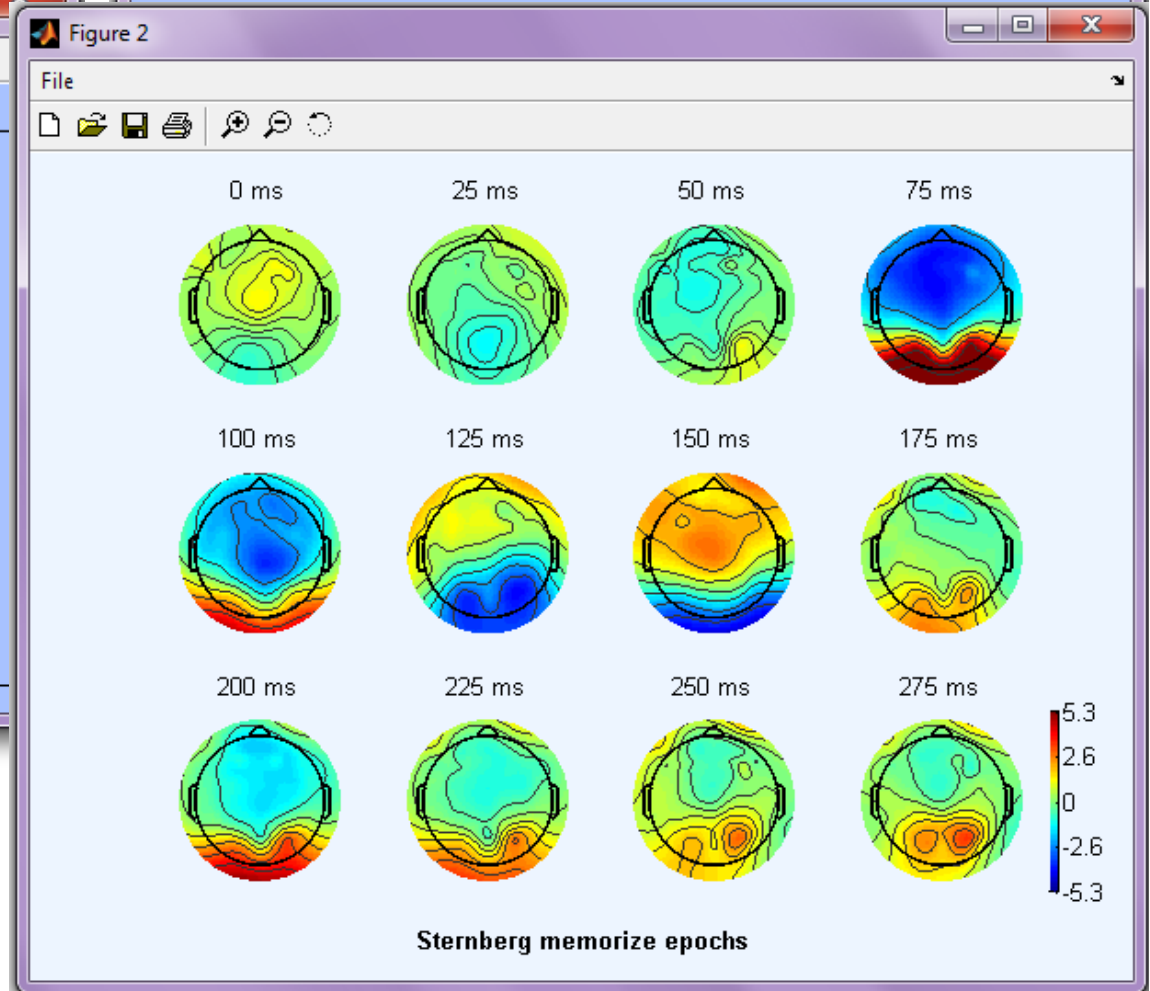
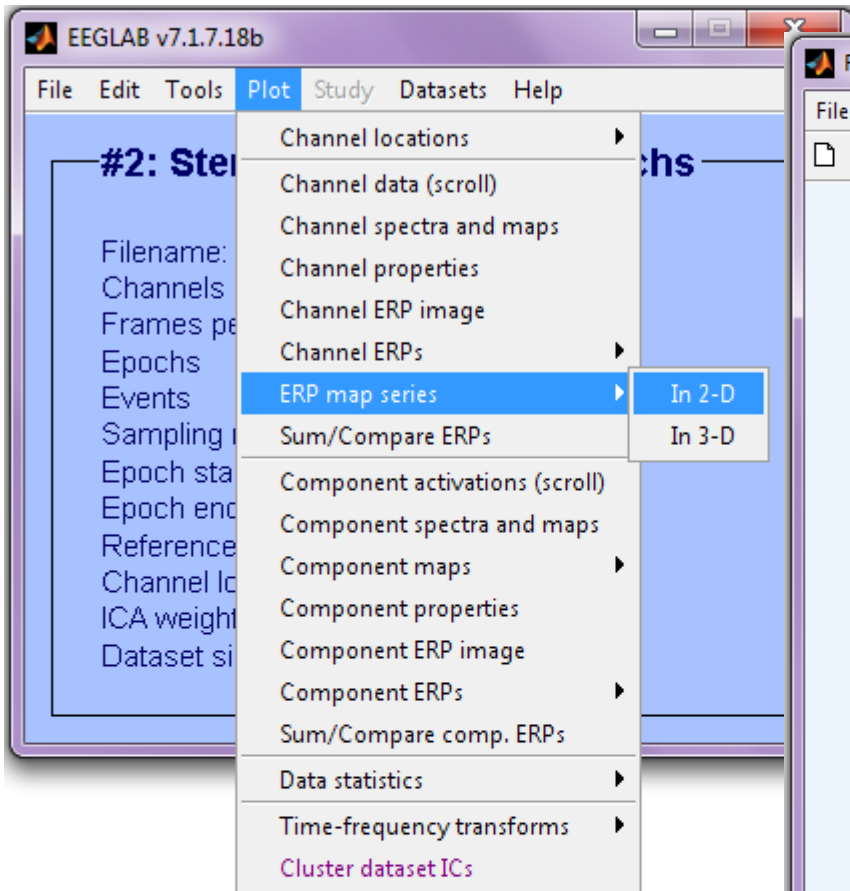
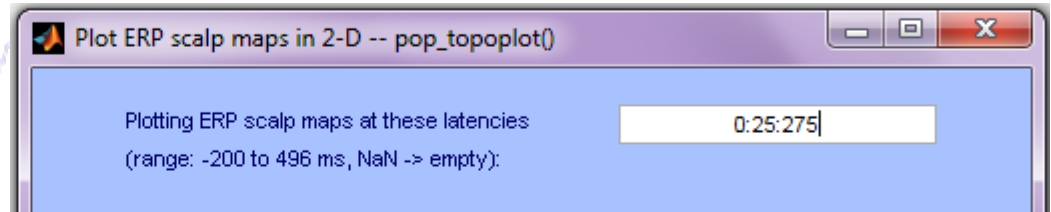
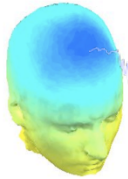
# Analysis of ERPs



# Channel ERP in rectangular array



# Analysis of ERPs

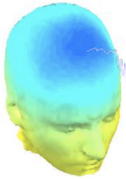


```
pop_topoplot(EEG,1,[0:25:275],'Memorize',[3 4],0,'electrodes','off');
```

EEGLAB Workshop XI, September 7-9, 2010, Hsinchu, Taiwan: Klaus Gramann – Data import



# Compare ERPs across conditions

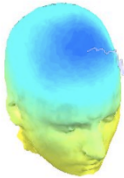


Filename:	none
Channels per frame:	177
Frames per epoch:	175
Epochs:	600
Events:	600
Sampling rate (Hz):	250
Epoch start (sec):	-0.200
Epoch end (sec):	0.496
Reference:	unknown
Channel locations:	Yes
ICA weights:	Yes
Dataset size (Mb):	64.5

How do 'Memorize' and 'Ignore' ERPs differ?



# Compare ERPs across conditions



EEGLAB v7.1.7.18b

File Edit Tools Plot Study Datasets Help

#2: Step

Filename: Channels Frames per Epochs Events Sampling Epoch start Epoch end Reference Channel location ICA weights Dataset size

Channel location Channel data (sc Channel spectra Channel properties Channel ERP images Channel ERPs ERP map series Sum/Compare ERP Component activation Component spectra Component maps Component properties Component ERPs Component ERPs Sum/Compare components Data statistics Time-frequency transforms Cluster dataset ICs

ERP grand average/RMS - pop\_comperp()

Datasets to average (ex: 1 3 4): 2 3

Datasets to average and subtract (ex: 5 6 7):

Plot difference

Channels subset ([]=all):

Highlight significant regions (.01 -> p=.01)

Use RMS instead of average (check):

Low pass (Hz) (for display only): 20

Plottopo options ('key', 'val'): 'ydir', 1

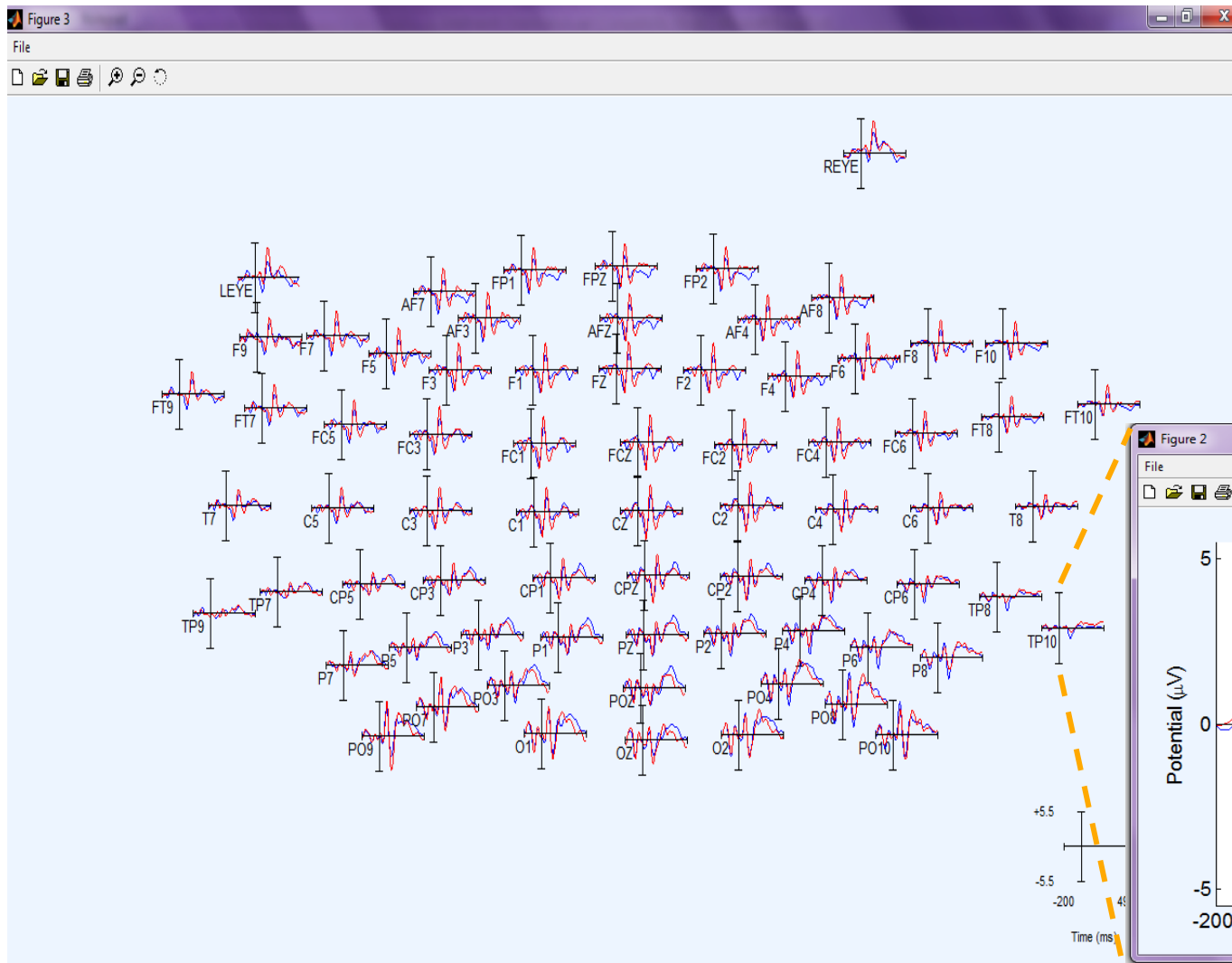
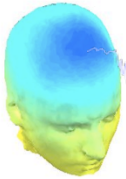
avg. std. all ERPs

Cancel Help Ok

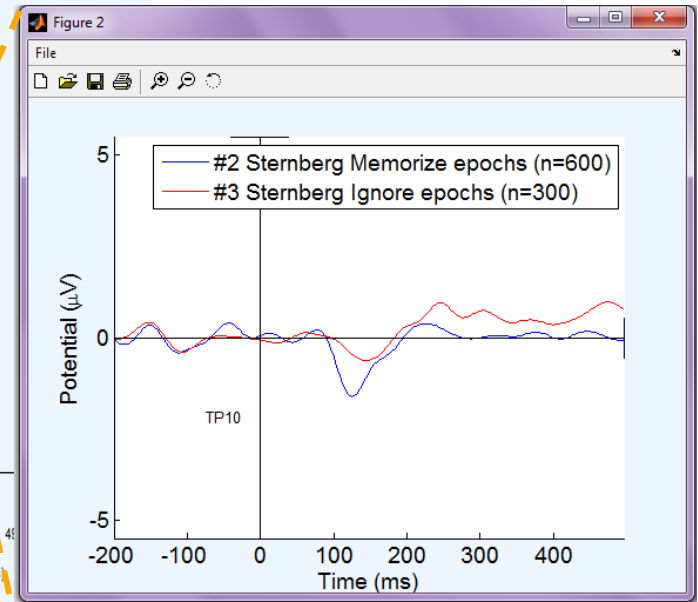
Compare ERPs from two conditions

```
>>pop_comperp(ALLEEG,1,[2 3],[],'addavg','off','addstd','off', ...  
'addall','on','diffavg','off','diffstd','off','lowpass',20, ...  
'tplotopt',{'ydir',1});
```

# Compare ERPs across conditions



Click on an axis  
to see larger image



# Analysis of ERP differences



Plot difference  
between two conditions

ERP grand average/RMS - pop\_comperp

	avg.	std.	all ERPs
Datasets to average (ex: 1 3 4):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Datasets to average and subtract (ex: 5 6 7):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plot difference	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Channels subset ([]=all):

Highlight significant regions (.01 -> p=.01)

Use RMS instead of average (check):

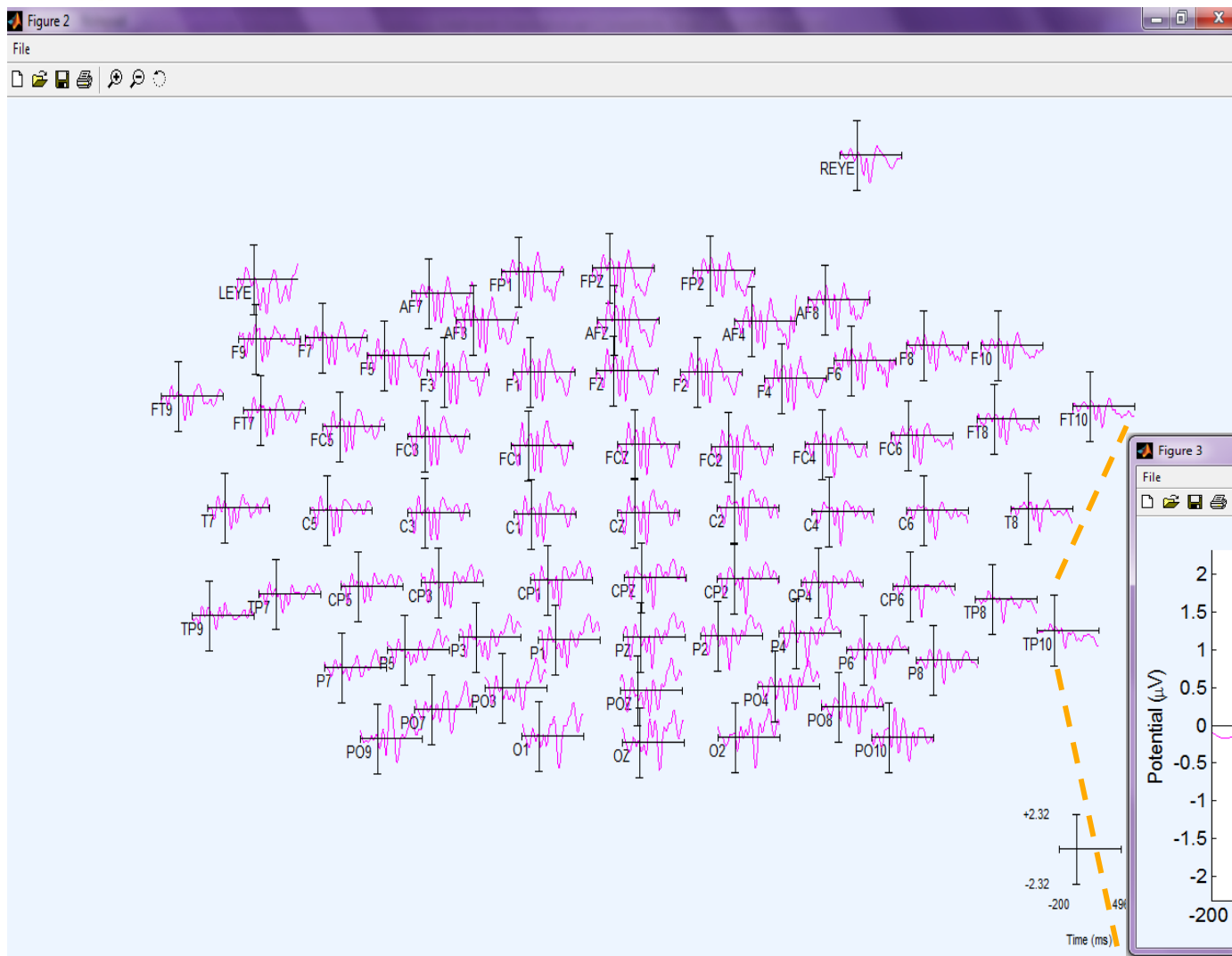
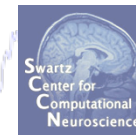
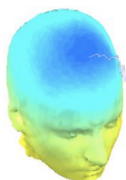
Low pass (Hz) (for display only): 20

Plotopto options ('key', 'val'): Help 'ydir', 1

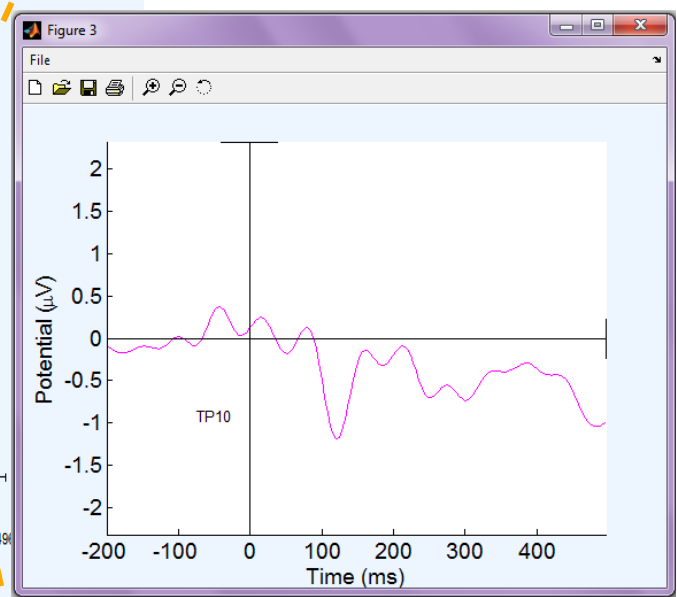
Cancel Help Ok

```
>> pop_comperp(ALLEEG, 1, 2, 3, 'addavg', 'off', ...  
'addstd', 'off', 'diffavg', 'on', 'diffstd', 'off', ...  
'lowpass', 20, 'tplotopt', {'ydir', 1});
```

# Analysis of ERP differences



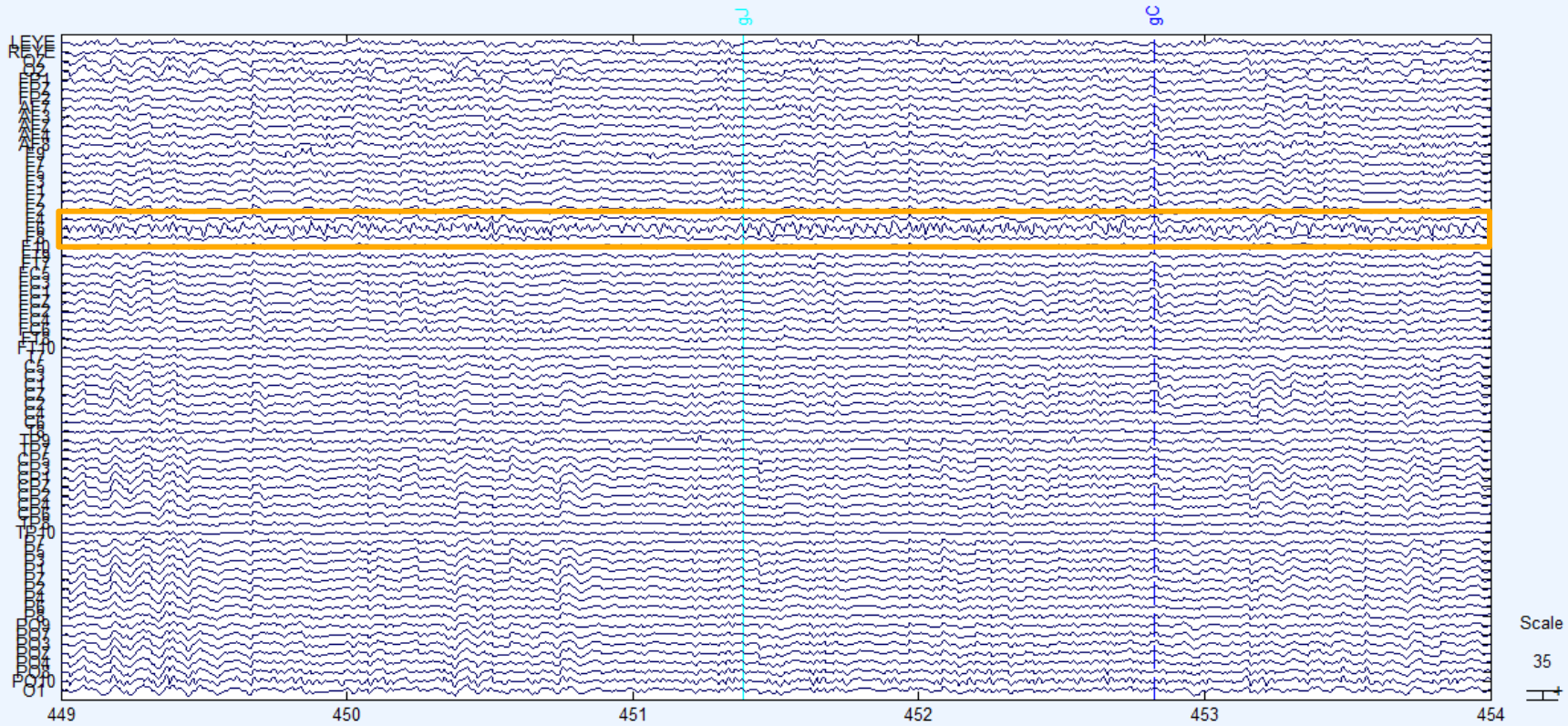
ERP  
difference  
between  
2 conditions



# Remove channel

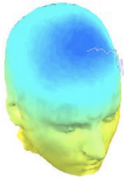


Scroll channel activities -- eegplot() Figure Display Settings Help



CANCEL Event types << < 449 > >> Chan. Time Value 01 451.0988 3.6619 35 + - REJECT

# Remove channel(s)



EEGLAB v7.1.7.18b

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)

Continuous Data

Data\stern.set  
71  
610133  
1  
1303  
250  
0.000  
2440.528  
unknown  
Yes  
Yes  
351.4

(use shift|ctrl to select several)

- 1 - LEYE
- 2 - REYE
- 3 - OZ
- 4 - O2
- 5 - FP1
- 6 - FPZ
- 7 - FP2
- 8 - AF7
- 9 - AF3
- 10 - AFZ
- 11 - AF4
- 12 - AF8
- 13 - F9
- 14 - F7
- 15 - F5
- 16 - F3
- 17 - F1
- 18 - FZ
- 19 - F2
- 20 - F4
- 21 - F6**
- 22 - F8
- 23 - F10
- 24 - FT9
- 25 - FT7
- 26 - FC5
- 27 - FC2

Cancel Ok

Select data -- pop\_select()

Select data in: Input desired range on

Time range [min max] (s)

Point range (ex: [1 10])

Epoch range (ex: 3:2:10)

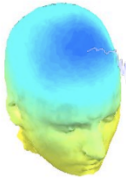
Channel range

Scroll dataset

Cancel Help Ok



# Removing channel(s)



Select data -- pop\_select()

Select data in:	Input desired range	on->remove these
Time range [min max] (s)	<input type="text"/>	<input type="checkbox"/> ...
Point range (ex: [1 10])	<input type="text"/>	<input type="checkbox"/> ...
Epoch range (ex: 3:2:10)	<input type="text"/>	<input type="checkbox"/> ...
Channel range	<input type="text" value="F6"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> ...

Dataset info -- pop\_newset()

**What do you want to do with the new dataset?**

Name it:

Save it as file:

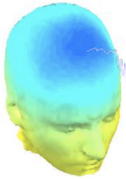
**What do you want to do with the old dataset (not modified since last saved)?**

Overwrite it in memory (set=yes; unset=create a new dataset)

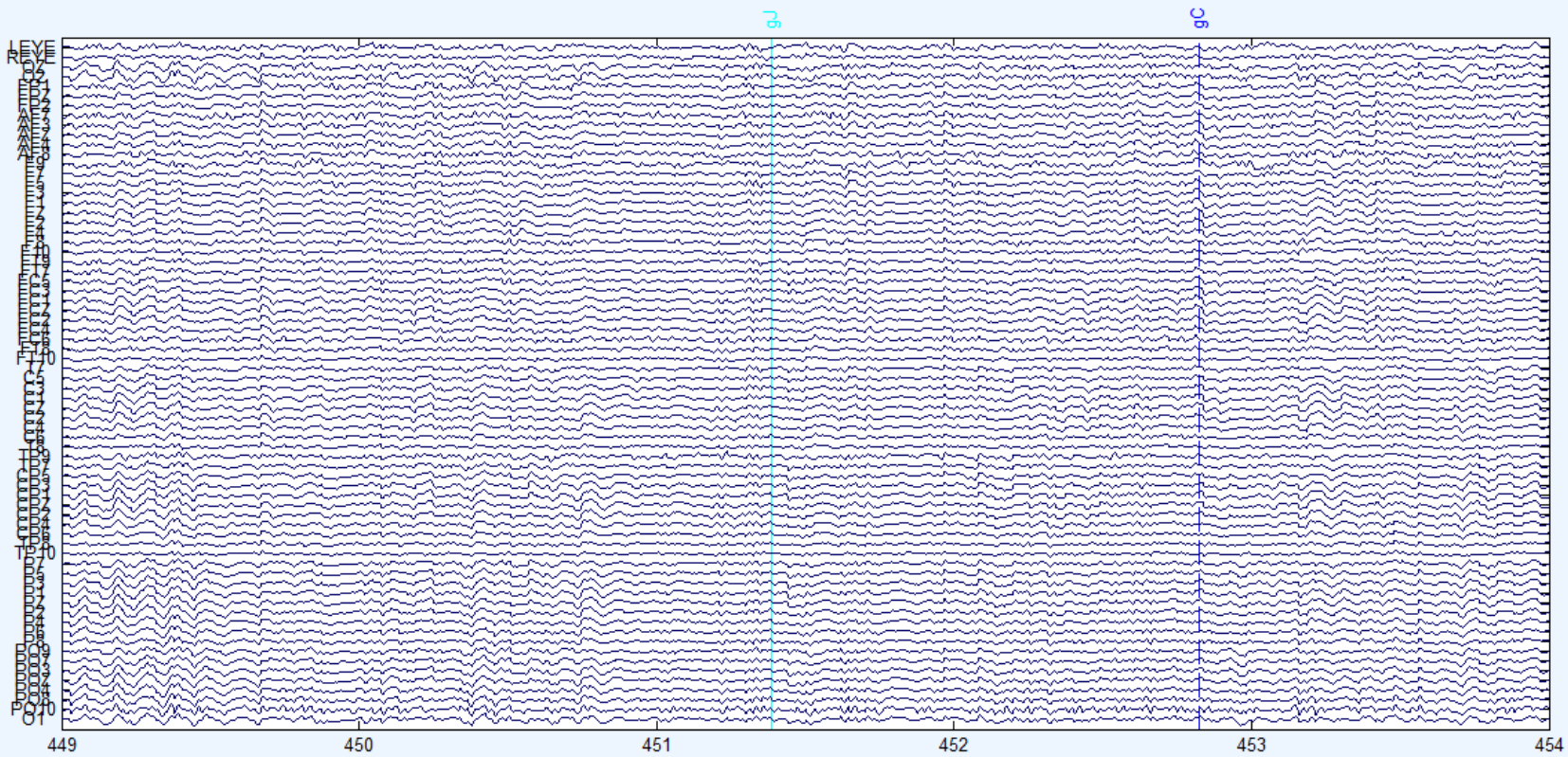




# Channel removed



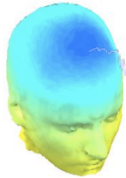
Scroll channel activities -- eegplot() Figure Display Settings Help



Scale 35

CANCEL Event types << < 449 > >> Chan. Time Value P8 453.5014 4.1308 35 + - REJECT

# Interpolate bad channel



EEGLAB v7.1.7.18b

File Edit **Tools** Plot Study Datasets Help

- Change sampling rate
- Filter the data
- Re-reference
- Interpolate electrodes**
- Reject continuous data by eye
- Extract epochs
- Remove baseline
- Run ICA
- Remove components
- Automatic channel rejection
- Automatic epoch rejection
- Reject data epochs
- Reject data using ICA
- Locate dipoles using DIPFIT 2.x
- Peak detection using EEG toolbox
- FMRIB Tools
- Locate dipoles using LORETA

Interpolate channel(s) --...

What channel(s) to interpolate

none

Select from non-data channels

Select from other dataset

Use list of other dataset

Interpolation method: Spherical

Cancel Help Ok

Choose a channel from other dataset

Auto-select deleted channel from other dataset

Choose Dataset

Dataset index: 1

Cancel Help Ok

(use shift|ctrl to select several)

- LEYE
- REYE
- OZ
- O2
- FP1
- FPZ
- FP2
- AF7
- AF3
- AFZ
- AF4
- AF8
- F9
- F7
- F5
- F3
- F1
- FZ
- F2
- F4
- F6**
- F8
- F10
- FT9
- FT7
- EC5

Cancel Ok

Interpolate channel(s) --...

What channel(s) to interpolate

F6

Select from non-data channels

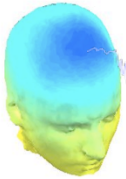
Select from other dataset

Use list of other dataset

Interpolation method: Spherical

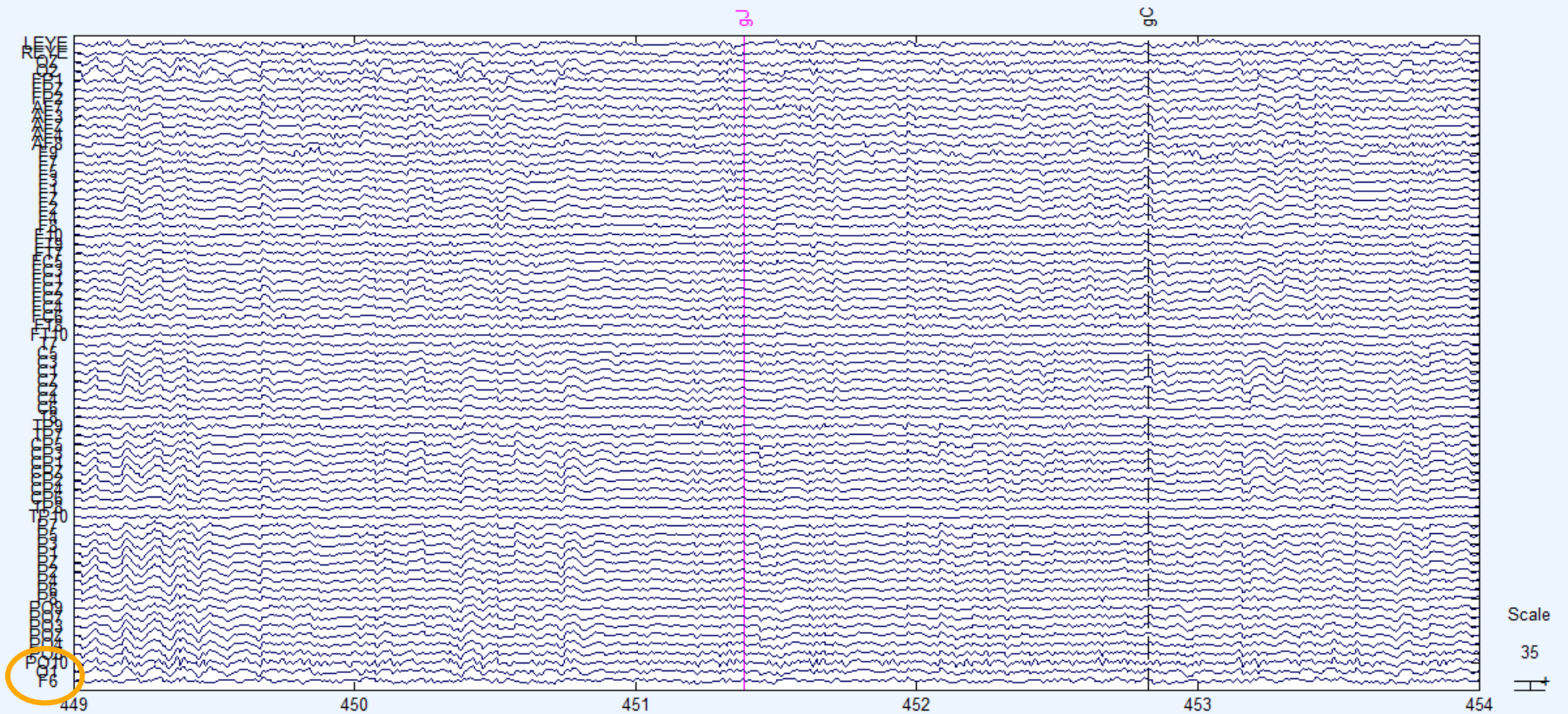
Cancel Help Ok

# Interpolated channel



Scroll channel activities -- eegplot() Figure Display Settings Help

Channel order changes, but scalp location is correct



Scale 35

CANCEL Event types << < 449 > >> Chan. Time Value LEVE 453.3298 -2.4448 35 + REJECT -

# Exercise



- **ALL**
  - Load stern.set
  - Do not save your changes under the same filename!
- **Novice**
  - Re-reference the data to Cz.
  - Scroll data and explore plotting options under 'Settings'.
- **Intermediate**
  - Review events in Edit->Event values, rename an event in Select epochs/events.
  - Remove a channel and then replace it by interpolation.
- **Advanced**
  - Epoch the data on Memorize and Ignore letters separately, then use pop\_comperp to compare ERPs between conditions.
  - Explore other menu options.

