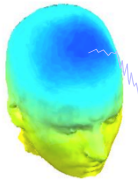
Evaluating ICA components



Plot 1

Component ERP

Plot 2

Component spectral power

Plot 3

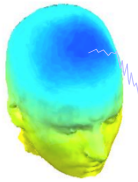
Component ERP images

Plot 4

Component ERSP

Exercise...

Evaluating ICA components



Plot 1

Component ERP

Plot 2

Component spectral power

Plot 3

Component ERP images

Plot 4

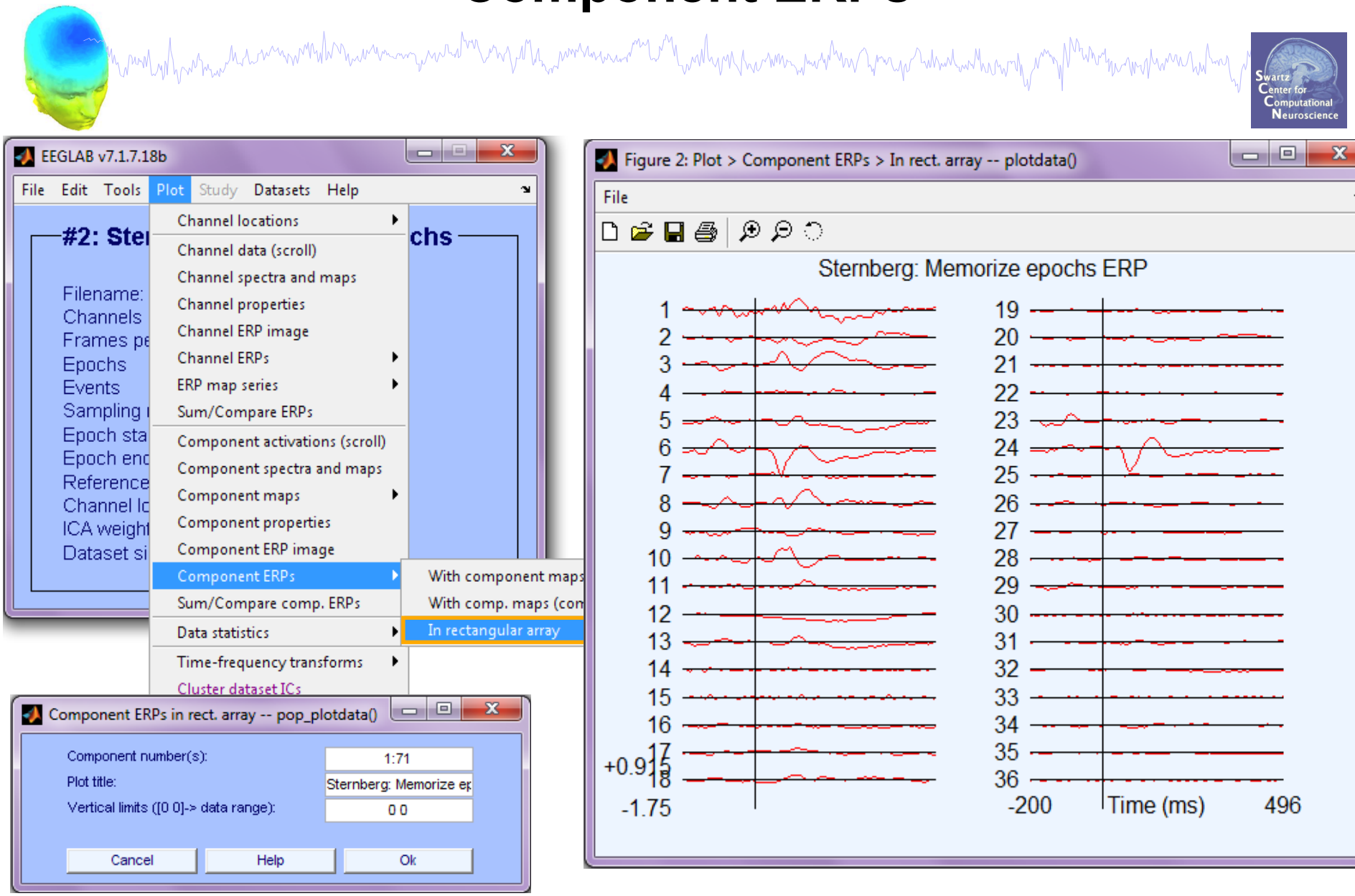
Component ERSP

Plot 5

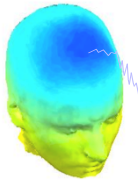
Component cross coherence

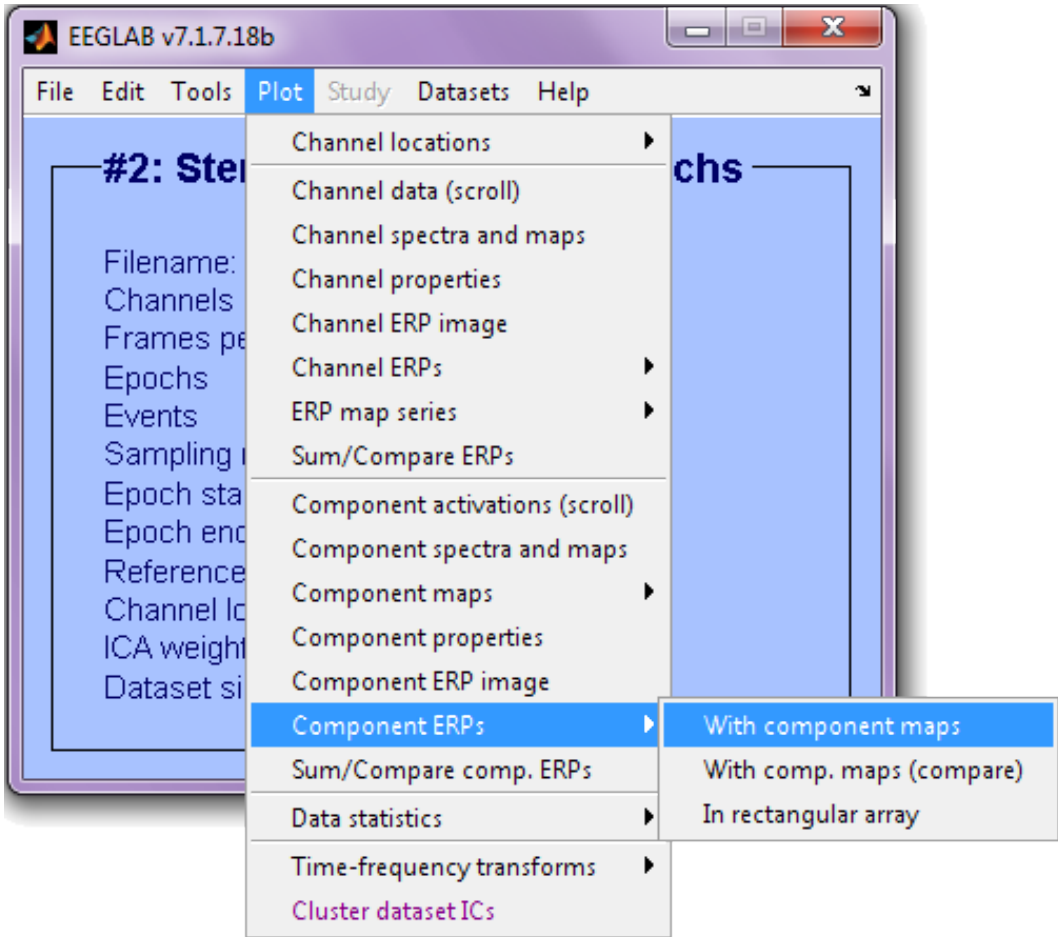
Exercise...

Component ERPs

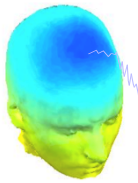


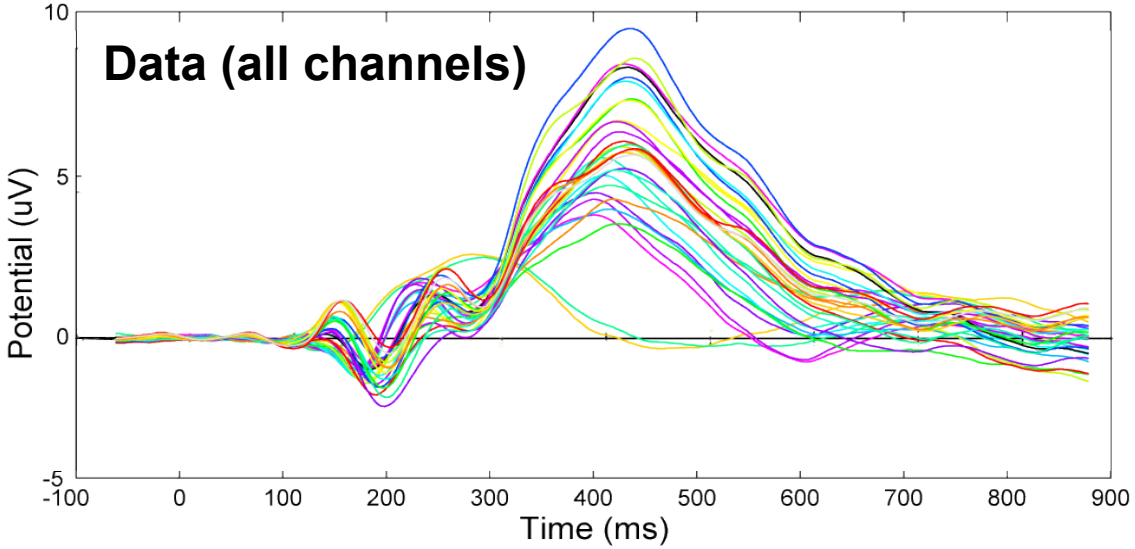
Component ERP envelope

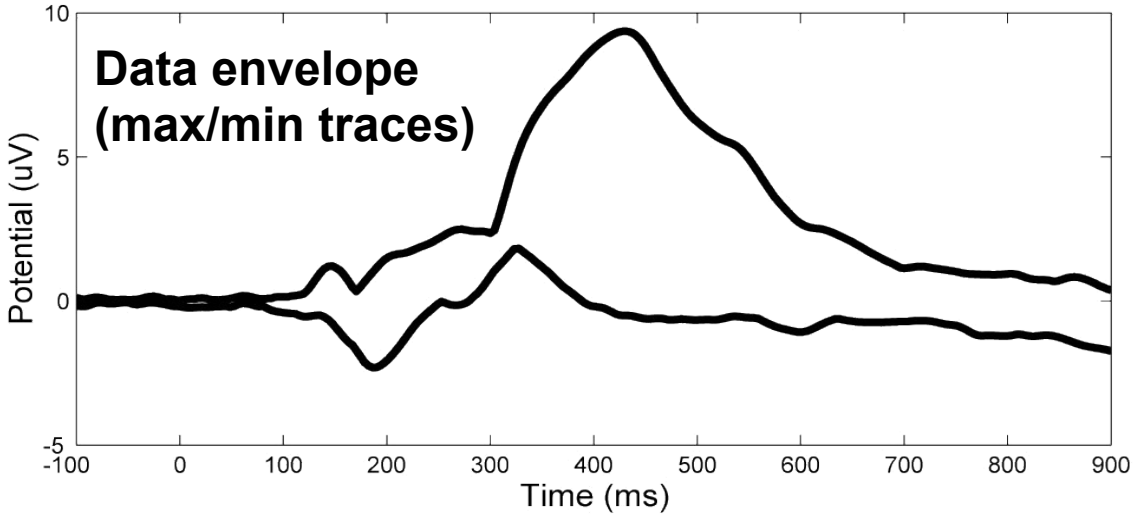




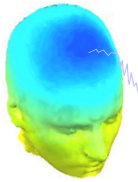
Definition: The data envelope

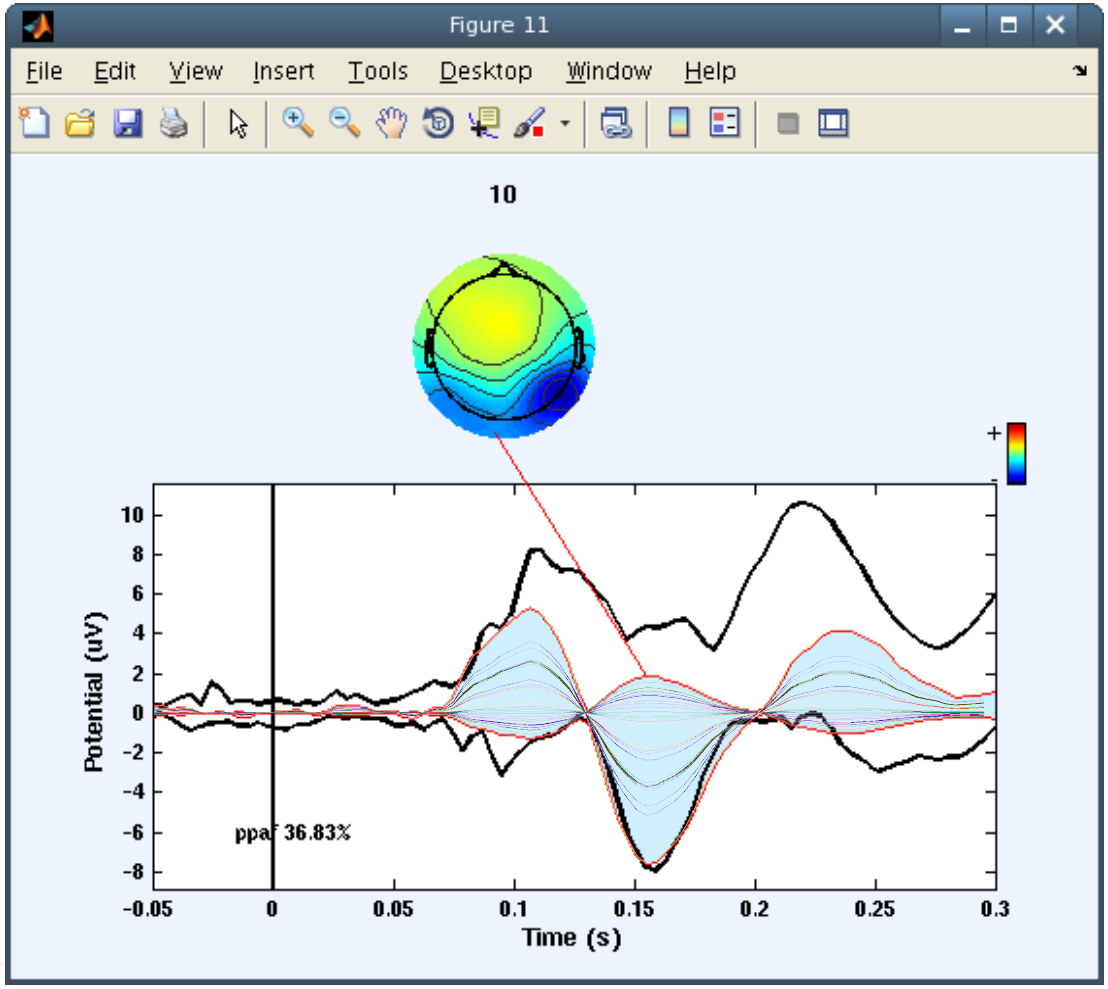




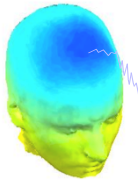


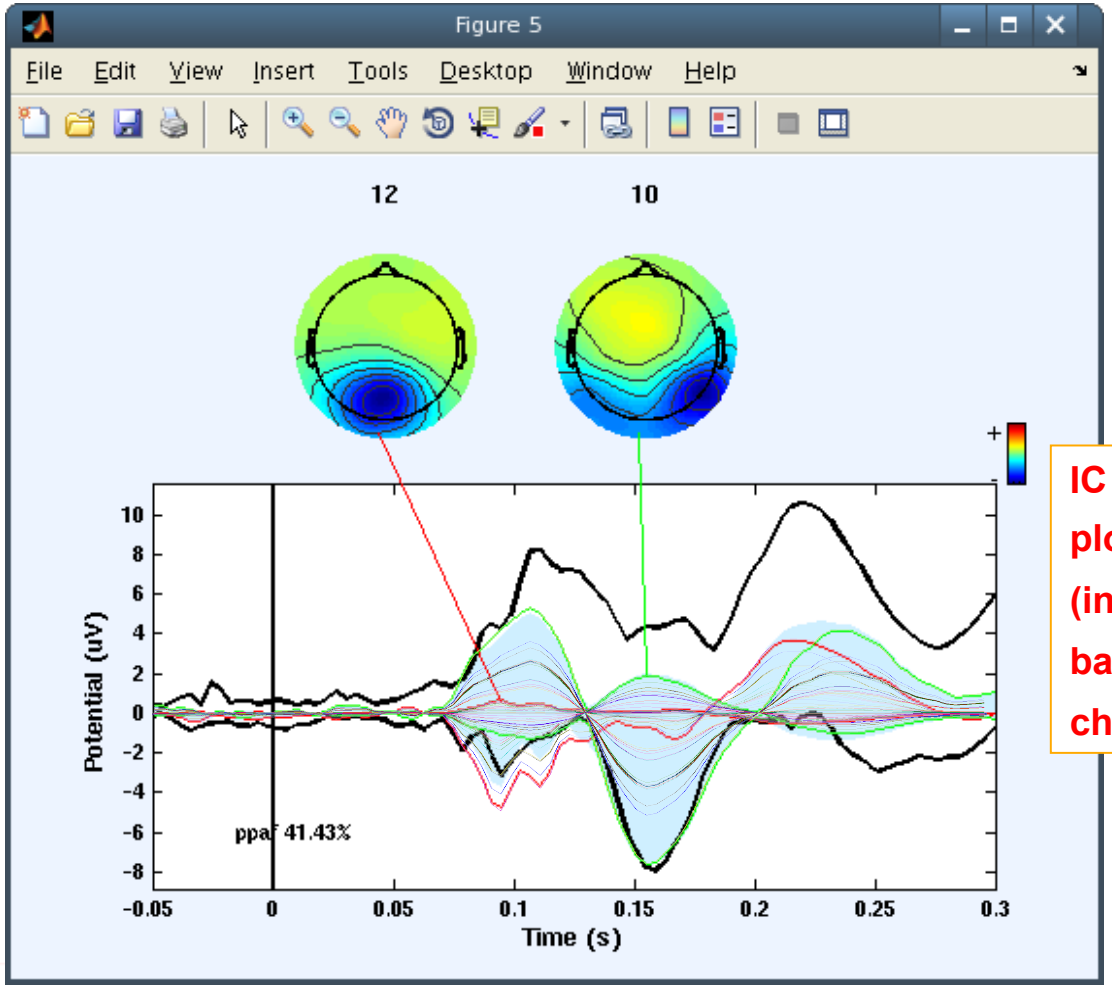
IC back-projection envelope





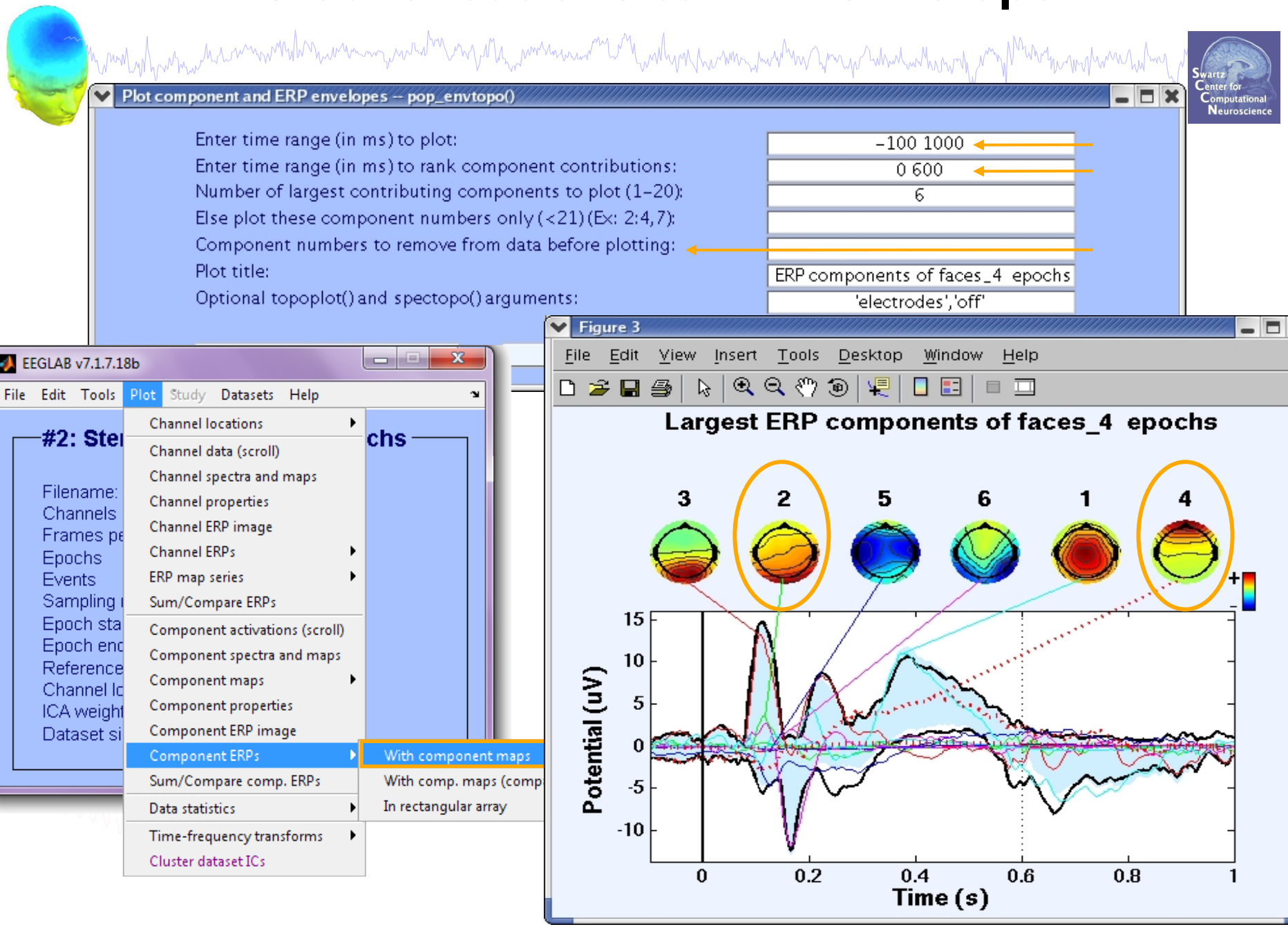
IC back-projection envelope



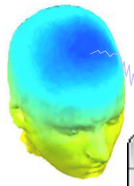


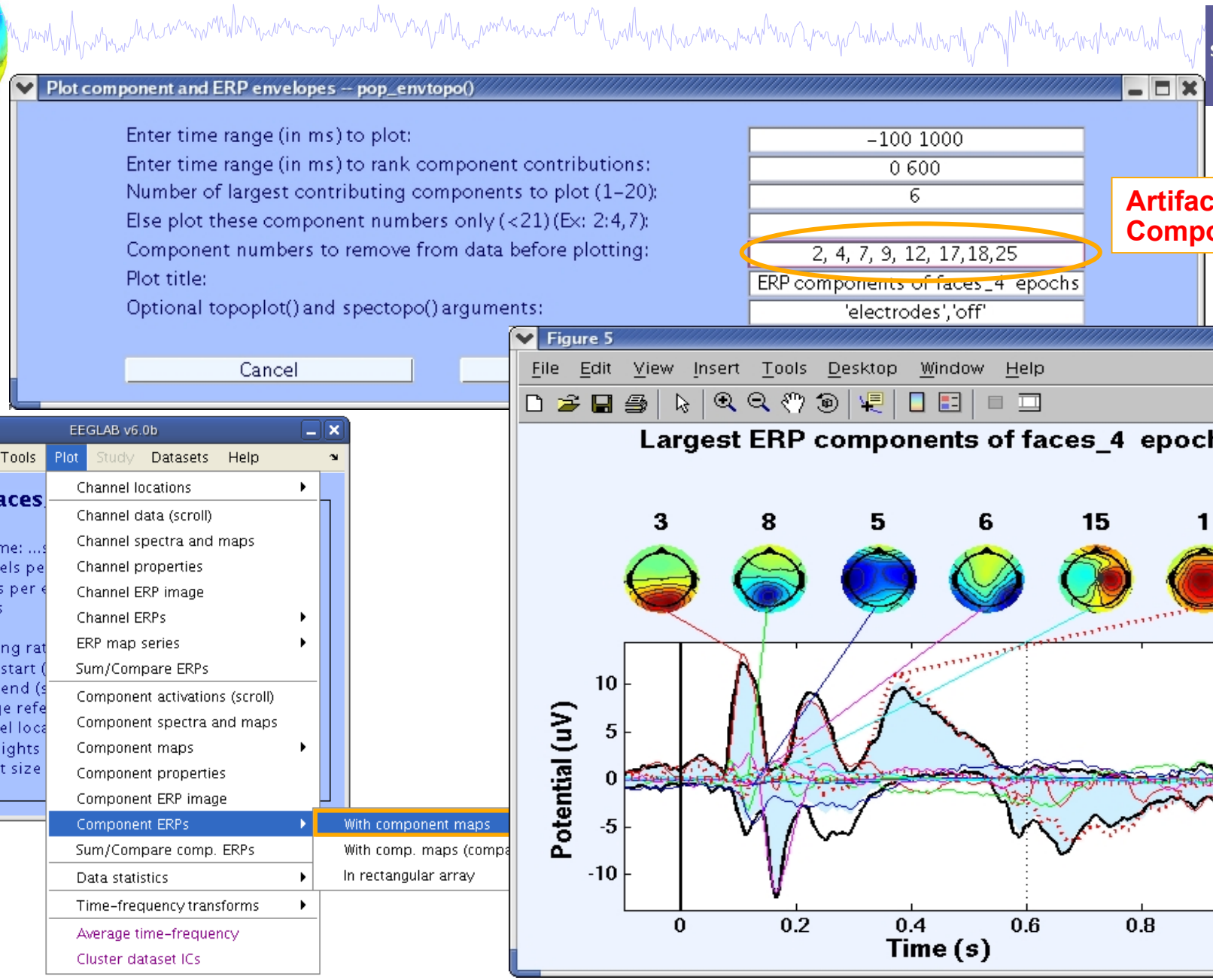
IC envelopes plotted for simplicity (instead of all back-projected channels)

IC contributions to ERP envelope

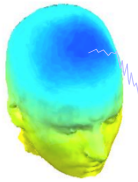


Component contribution to the dataset ERP

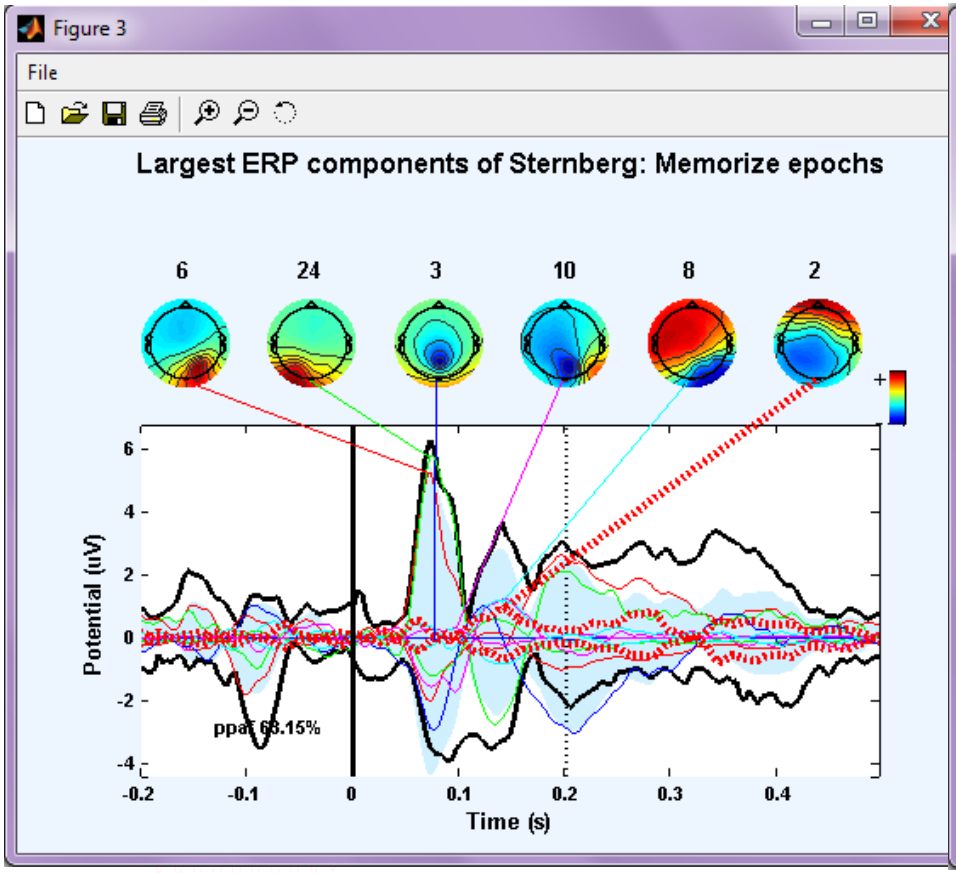


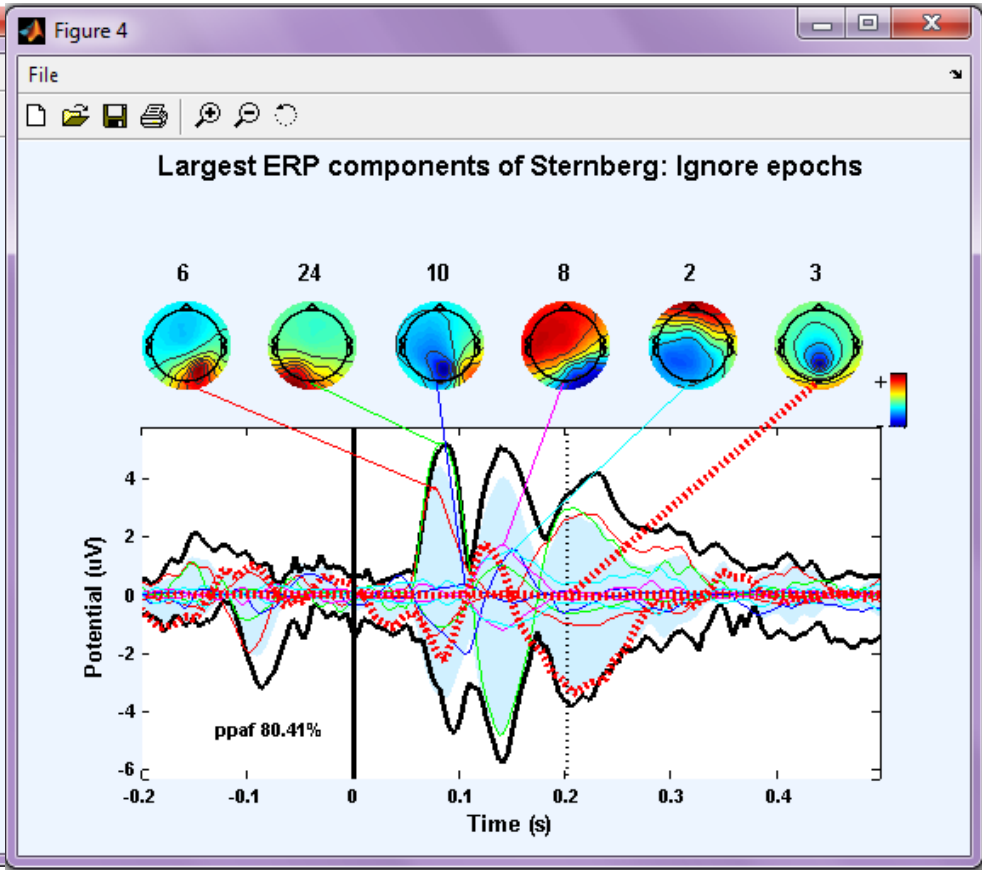


IC ERP difference

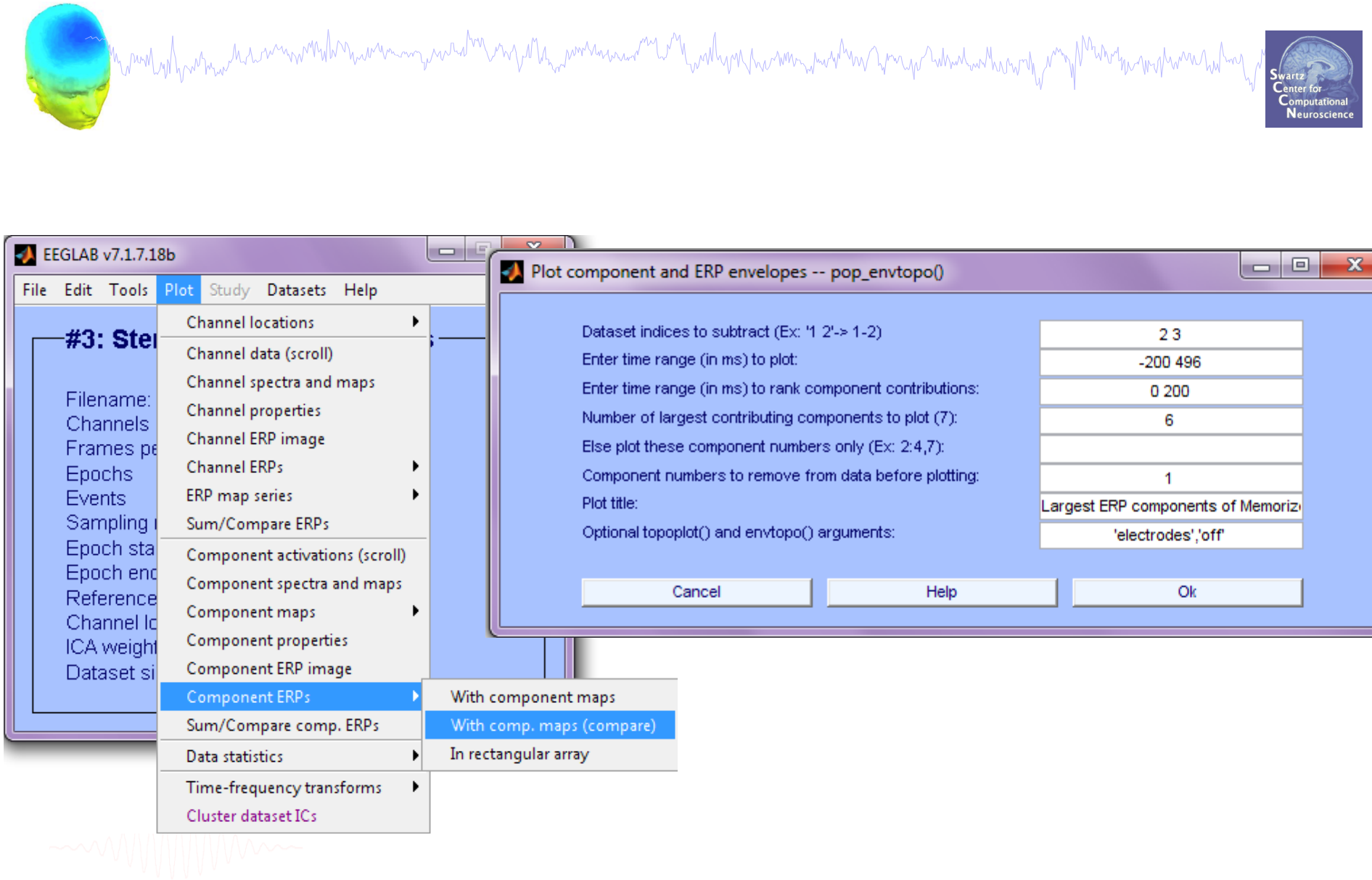


What is the IC ERP difference between these 2 conditions?

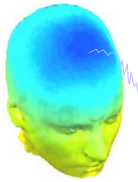


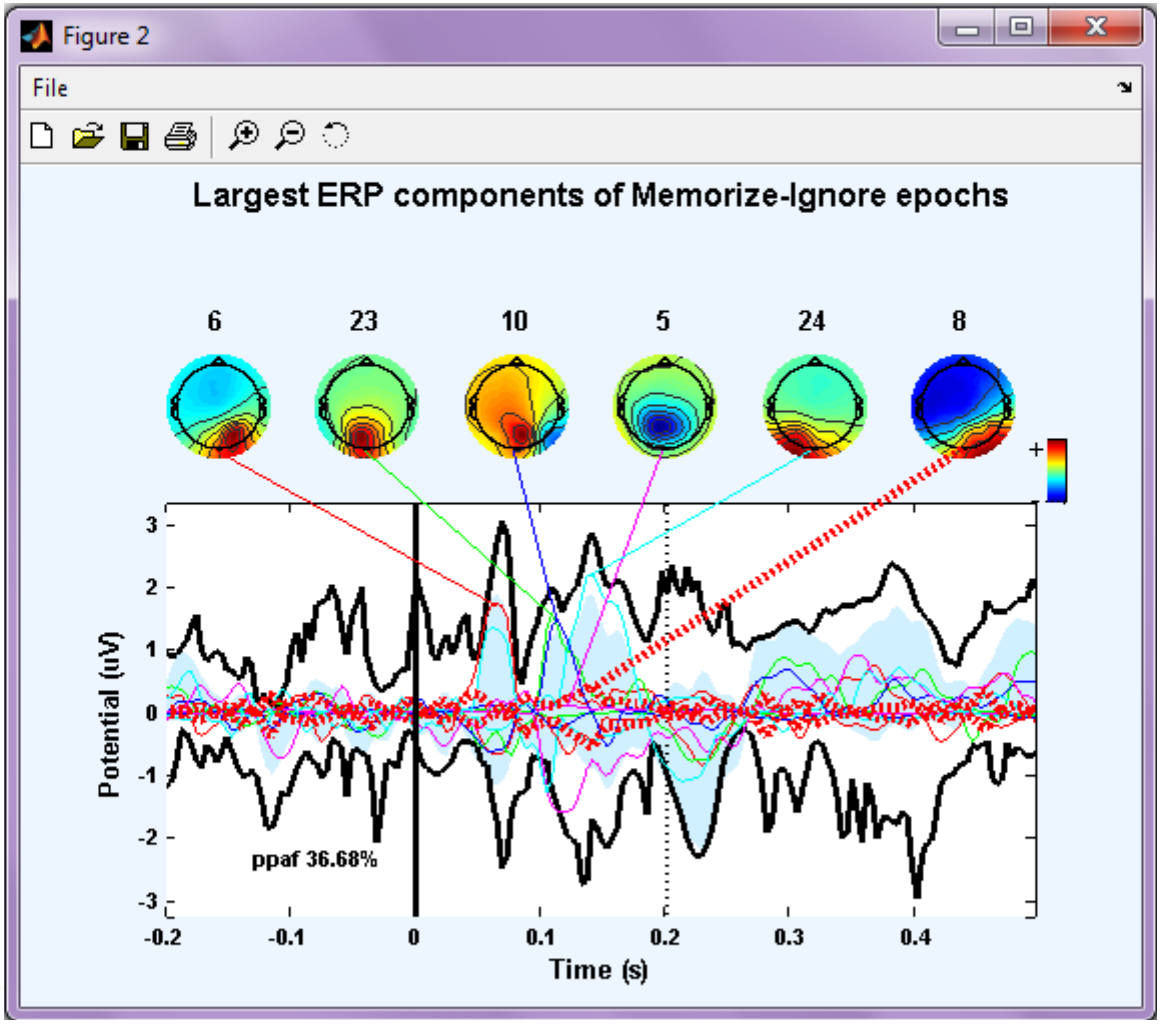


IC ERP difference

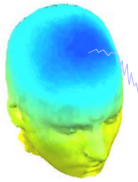


IC ERP difference





Evaluating ICA components



Plot 1

Component ERP

Plot 2

Component spectral power

Plot 3

Component ERP images

Plot 4

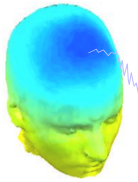
Component ERSP

Plot 5

Component cross coherence

Exercise...

Plot component power



Component spectra and maps -- pop_spectopo()

Epoch time range to analyze [min_ms max_ms]:	0 2440528
Frequency (Hz) to analyze:	10
Electrode number to analyze ([]=elec with max power; 0=whole scalp):	0
Percent data to sample (1 to 100):	20
Components to include in the analysis:	1:71
Number of largest-contributing components to map:	5
Else, map only these component numbers:	
[Checked] Compute comp spectra; [Unchecked] (data-comp) spectra:	☑
Plotting frequency range ([min max] Hz):	2 25
Spectral and scalp map options (see topoplot):	'electrodes','off'

Cancel | Help

EEGLAB v7.1.7.18b

File Edit Tools Pl

#1: Ste ta

Filename:
Channels
Frames pe
Epochs
Events
Sampling
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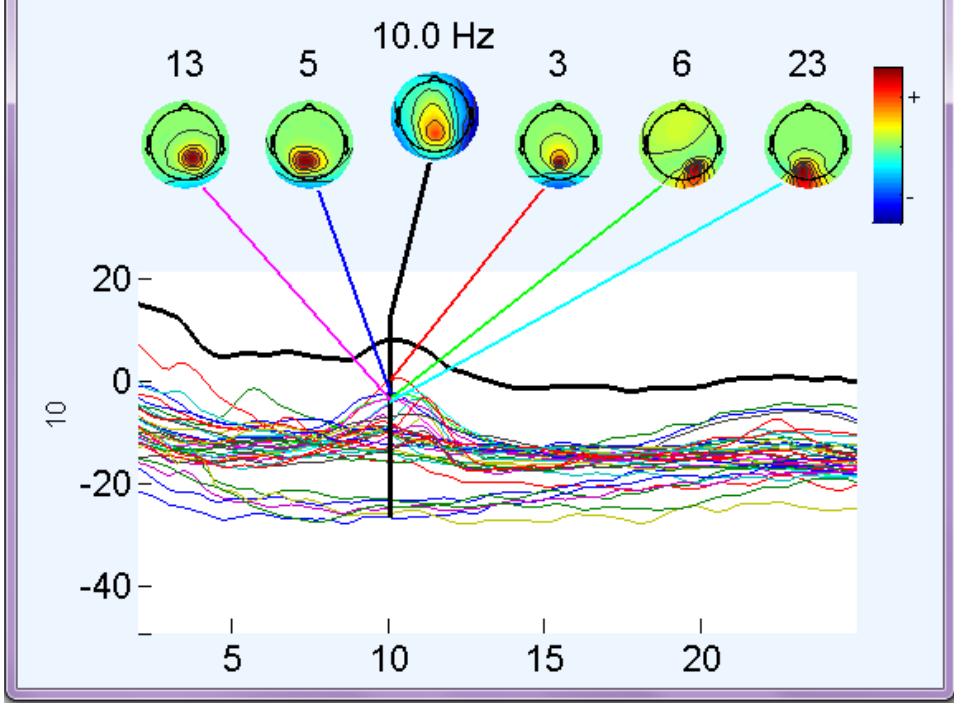
Dataset si

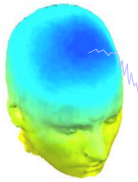
- Channel locations
- Channel data (scroll)
- Channel spectra and maps
- Channel properties
- Channel ERP image
- Channel ERPs
- ERP map series
- Sum/Compare ERPs
- Component activations (scroll)
- **Component spectra and maps**
- Component maps
- Component properties
- Component ERP image
- Component ERPs
- Sum/Compare comp. ERPs
- Data statistics

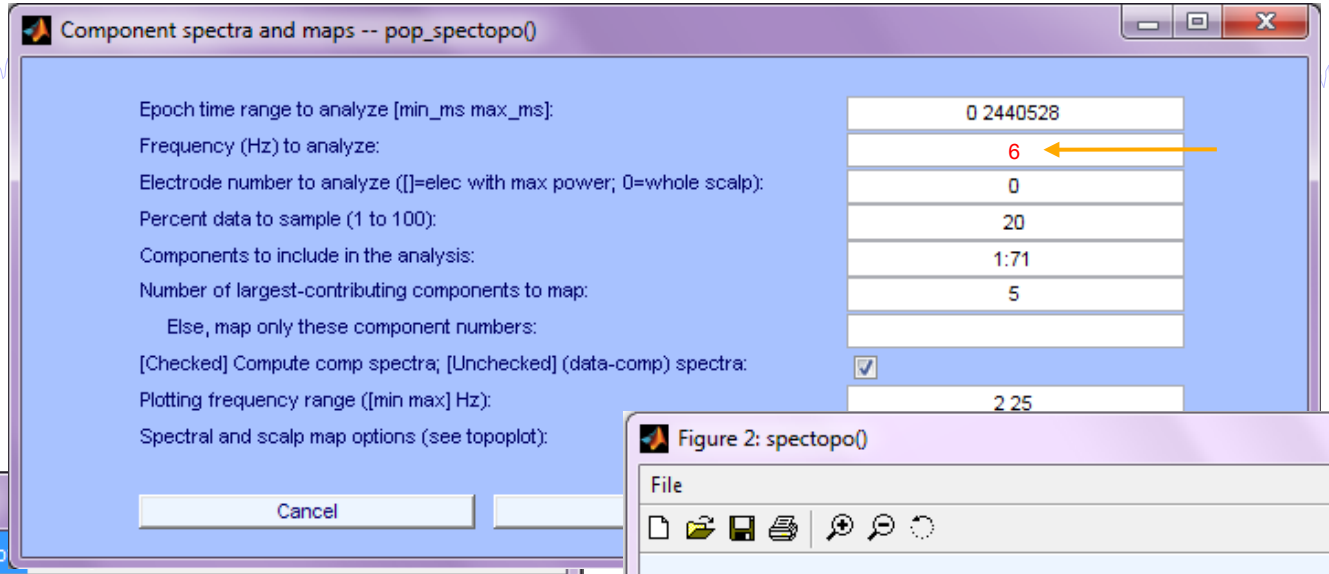
Figure 2: spectopo()

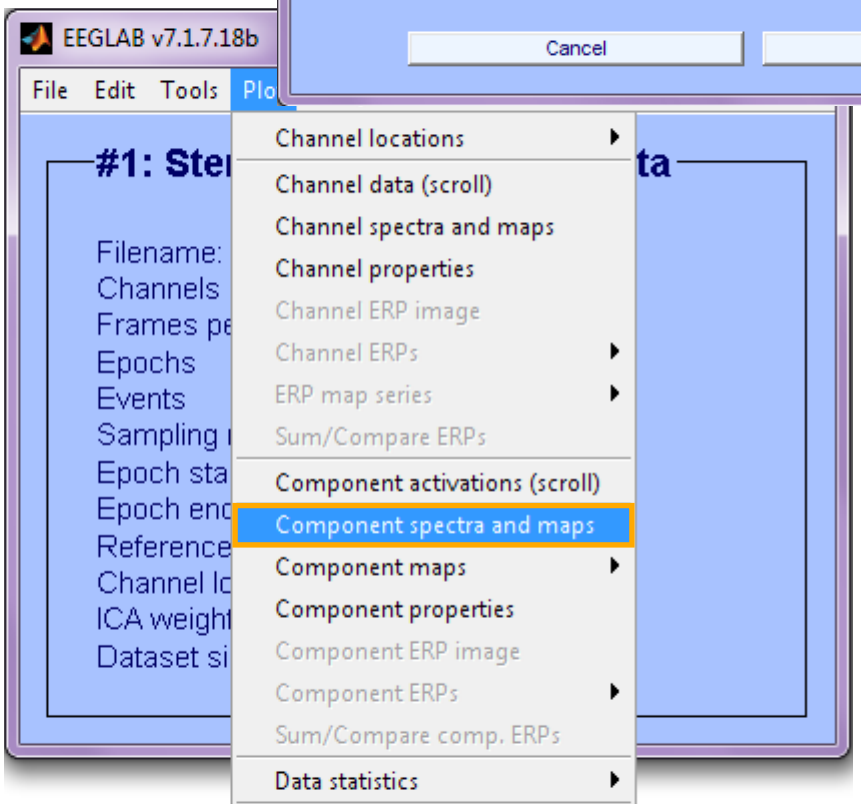
File

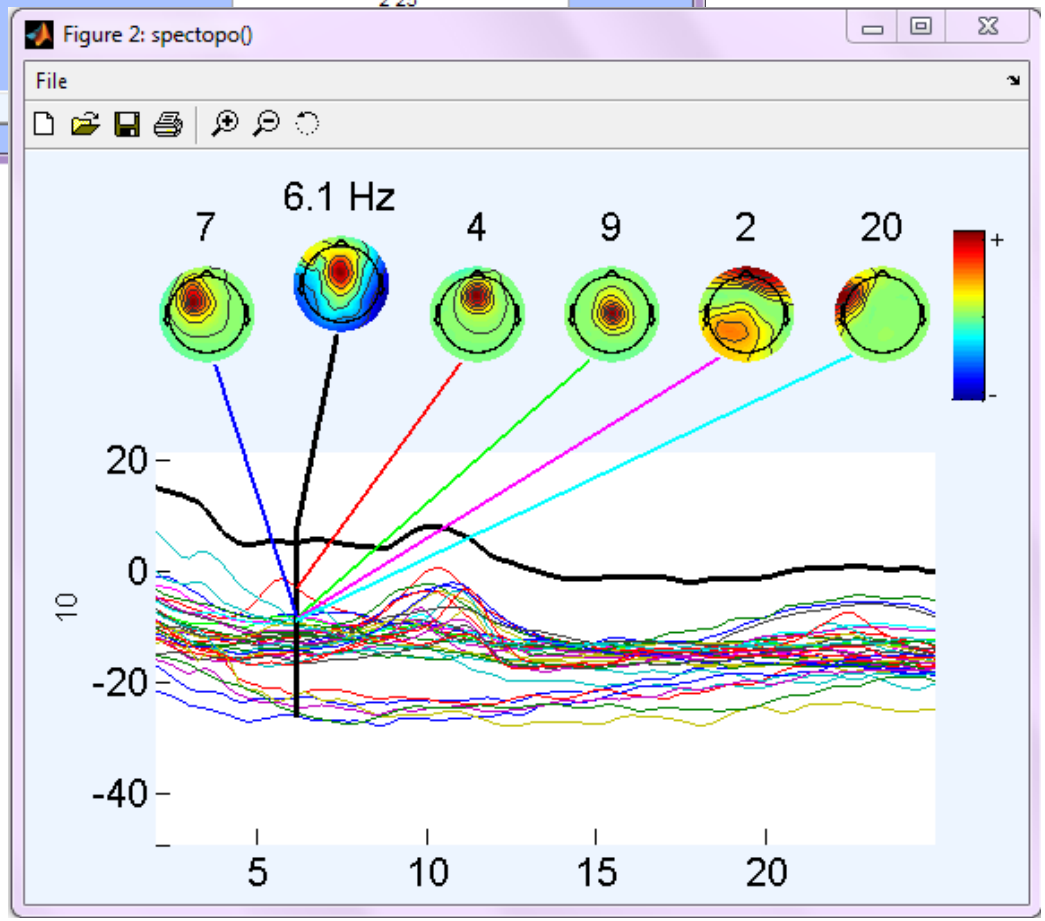


Plot component power

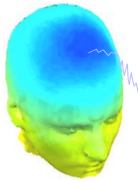








Evaluating ICA components



Plot 1

Component ERP

Plot 2

Component spectral power

Plot 3

Component ERP images

Plot 4

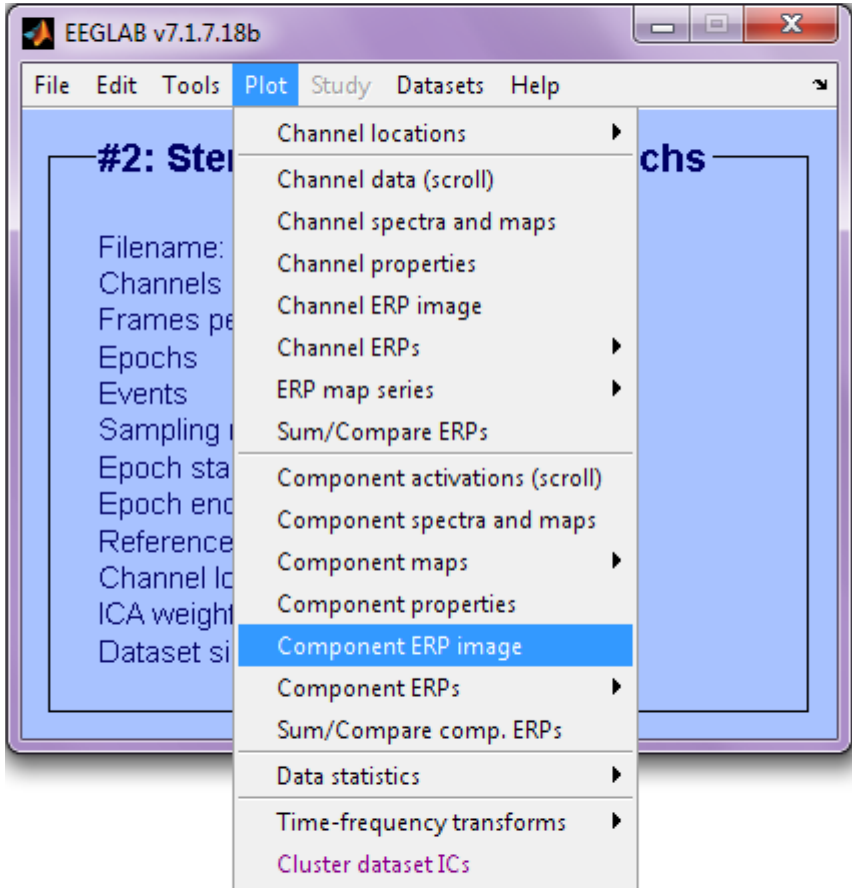
Component ERSP

Plot 5

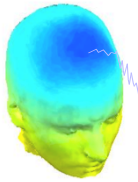
Component cross coherence

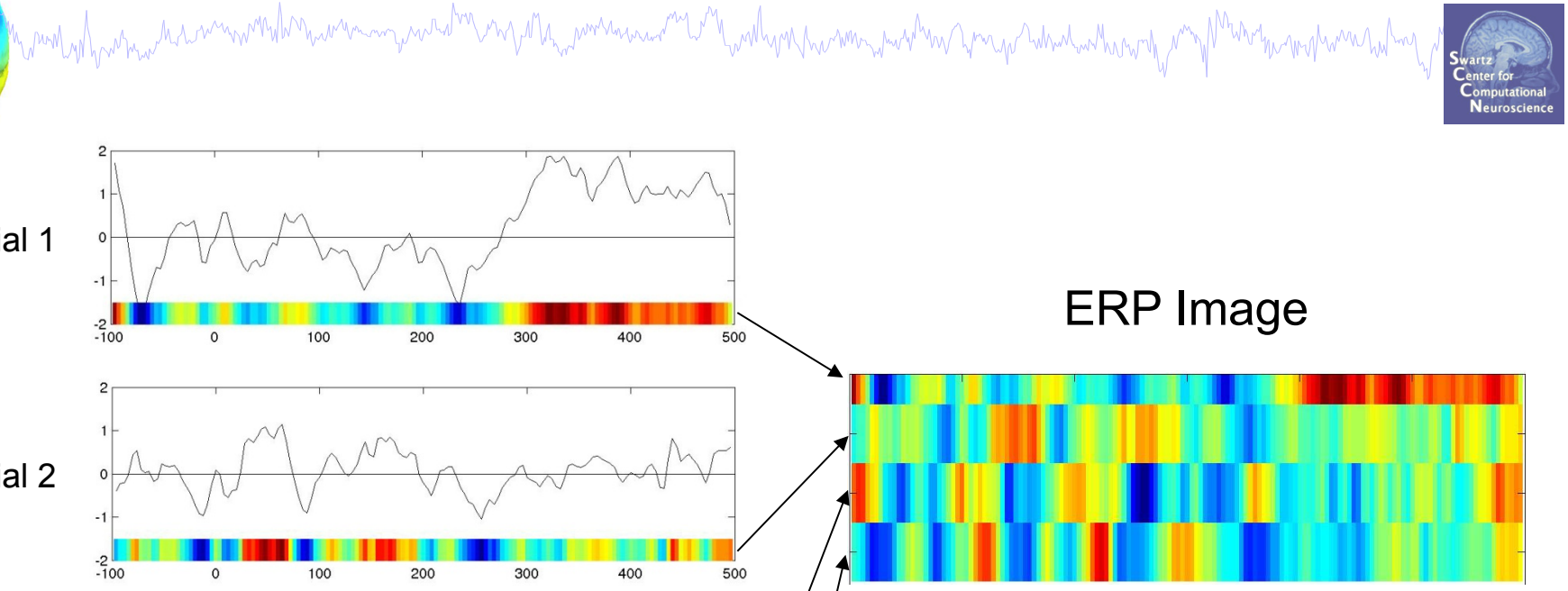
Exercise...

Component ERP image

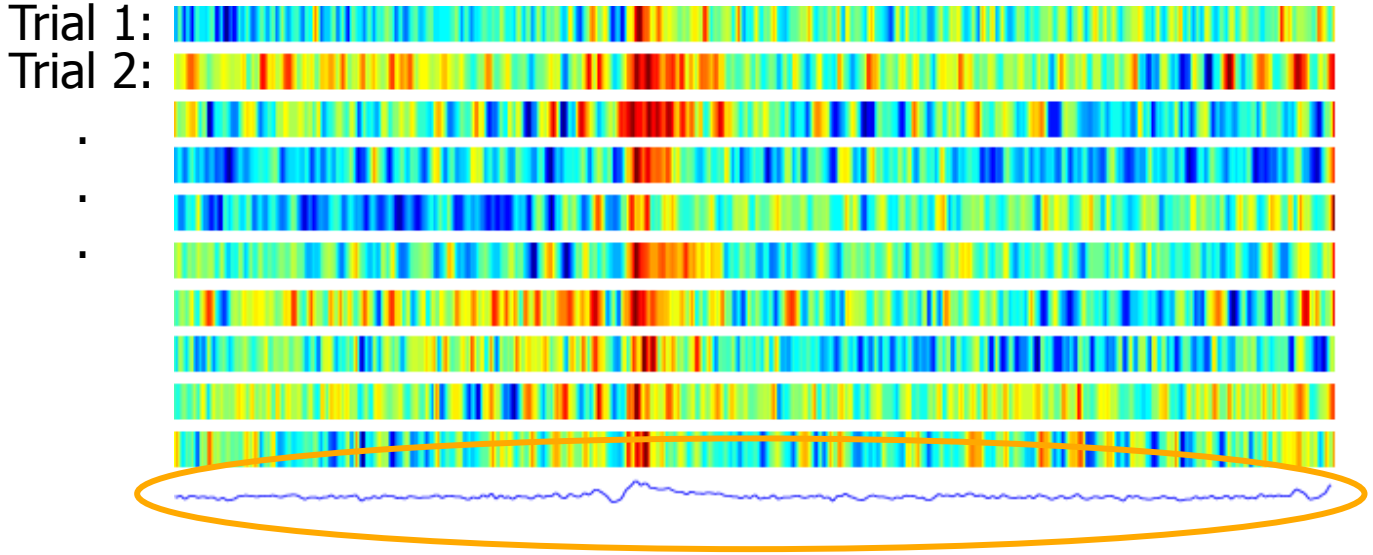


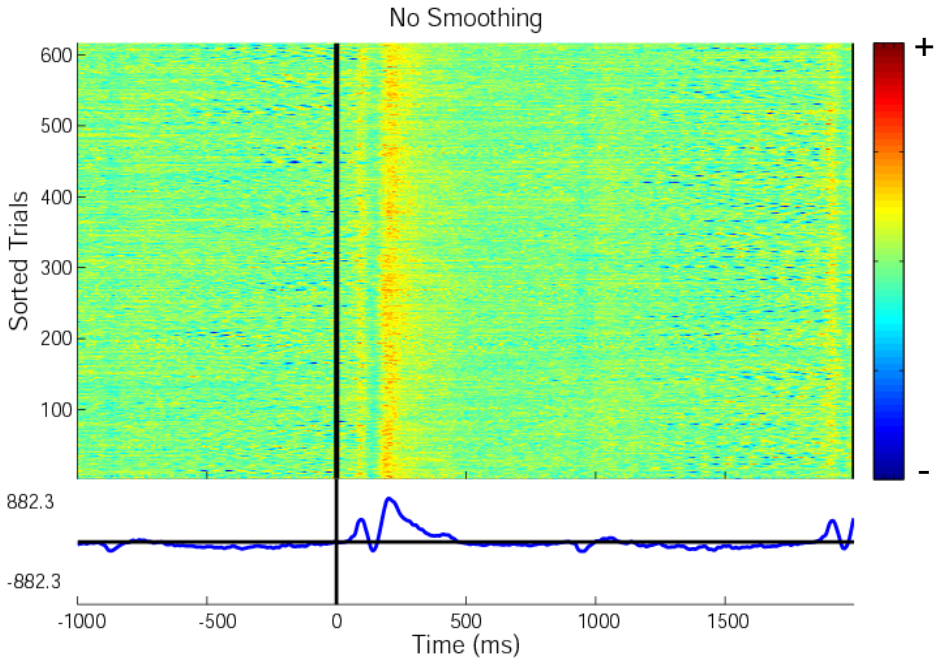
ERP Image basics

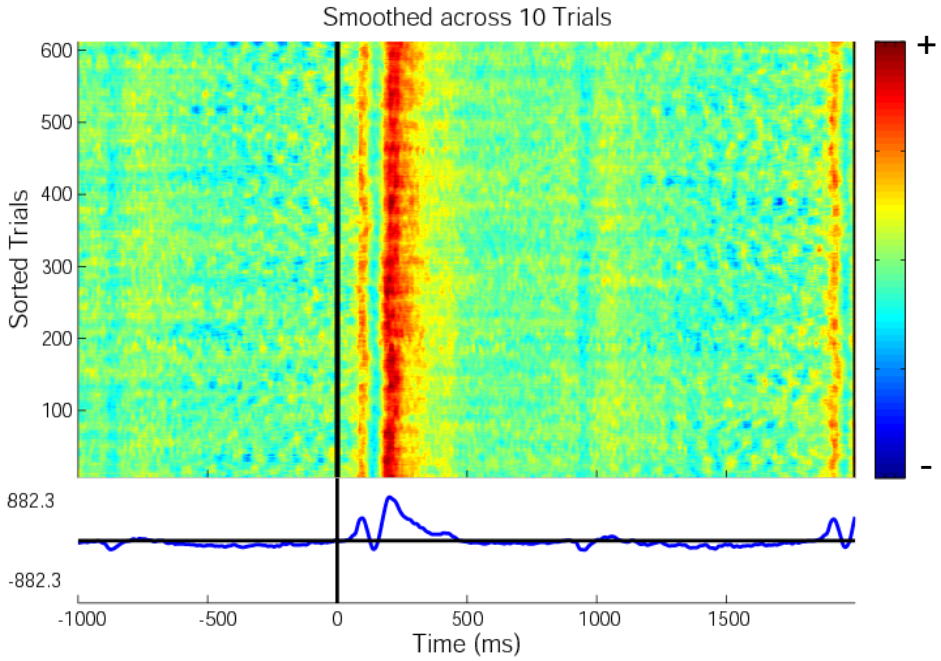




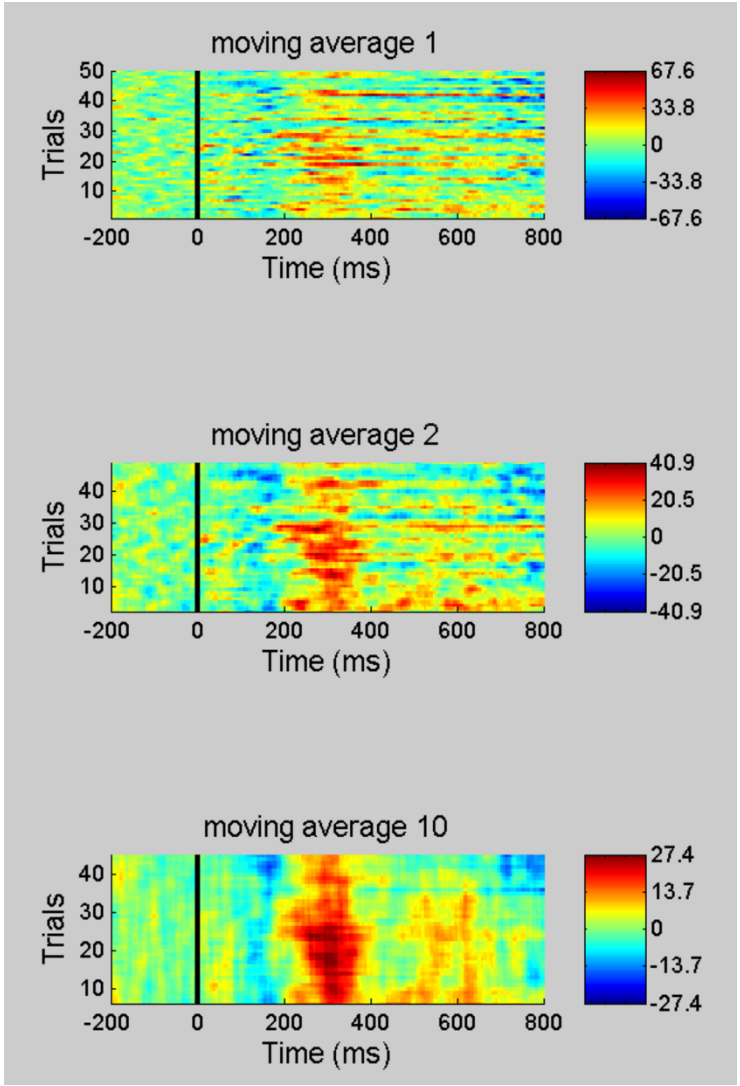
ERP Image basics



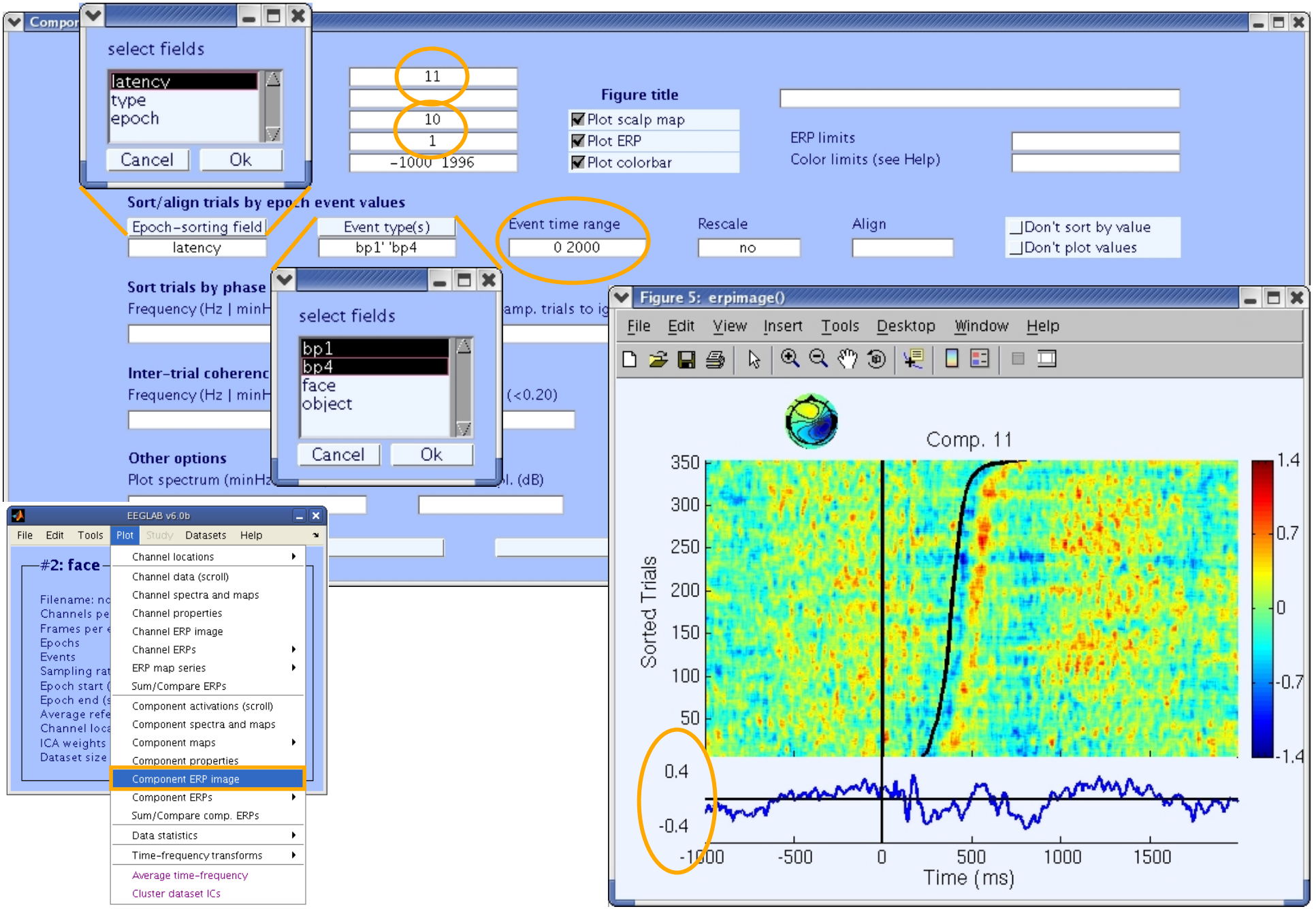




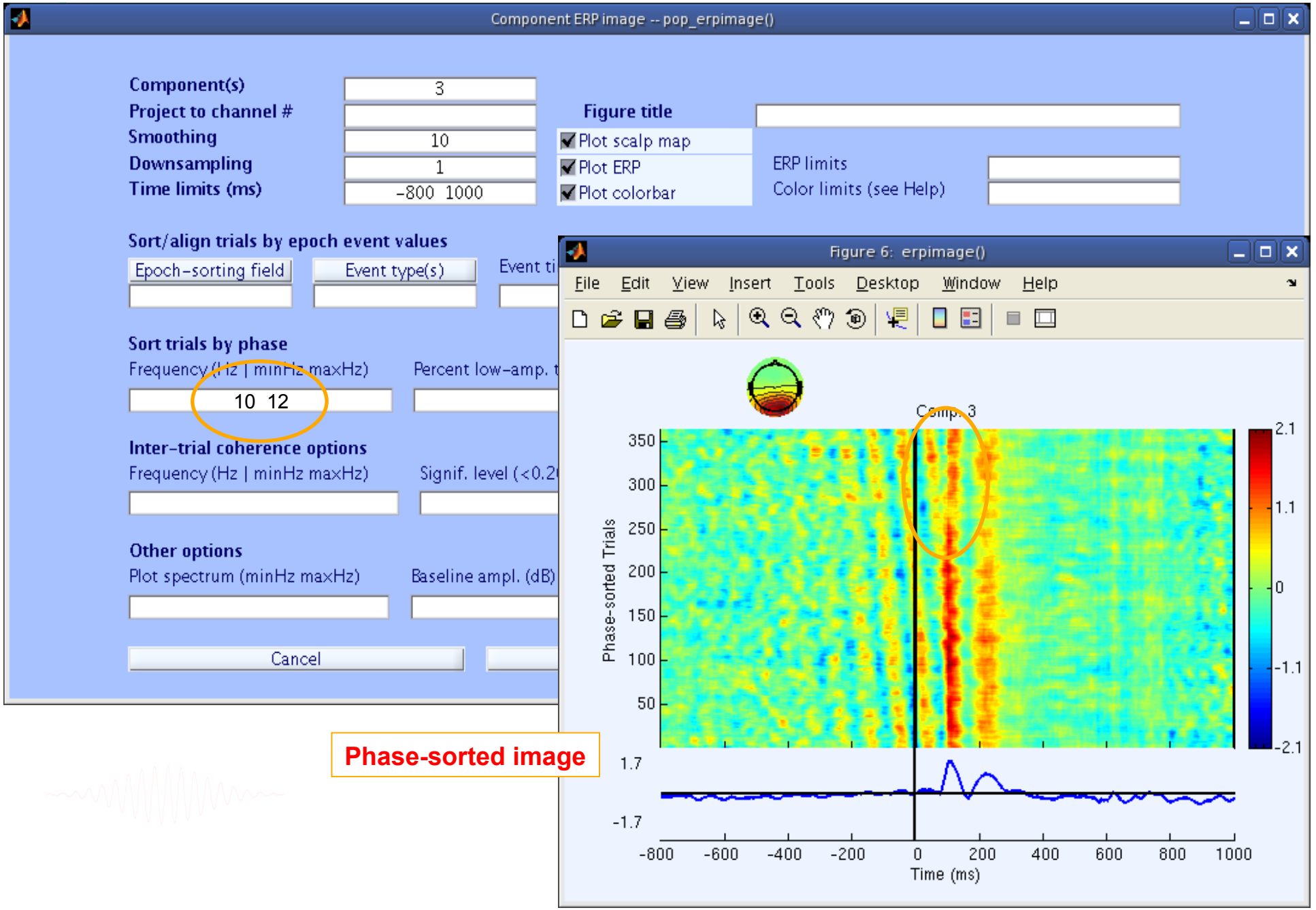
ERP Images: smoothing across trials



Component ERP Images

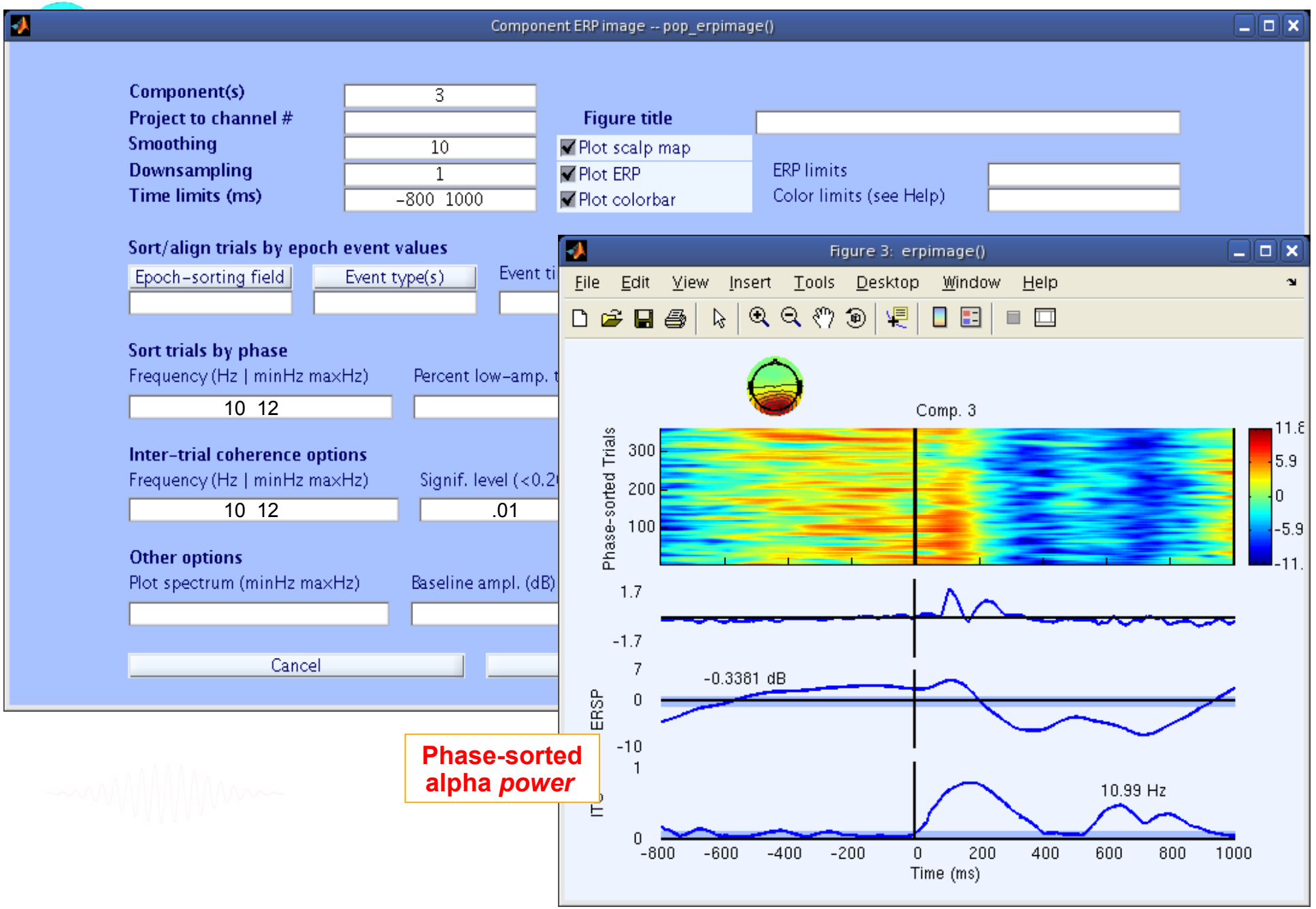


Component ERP Images



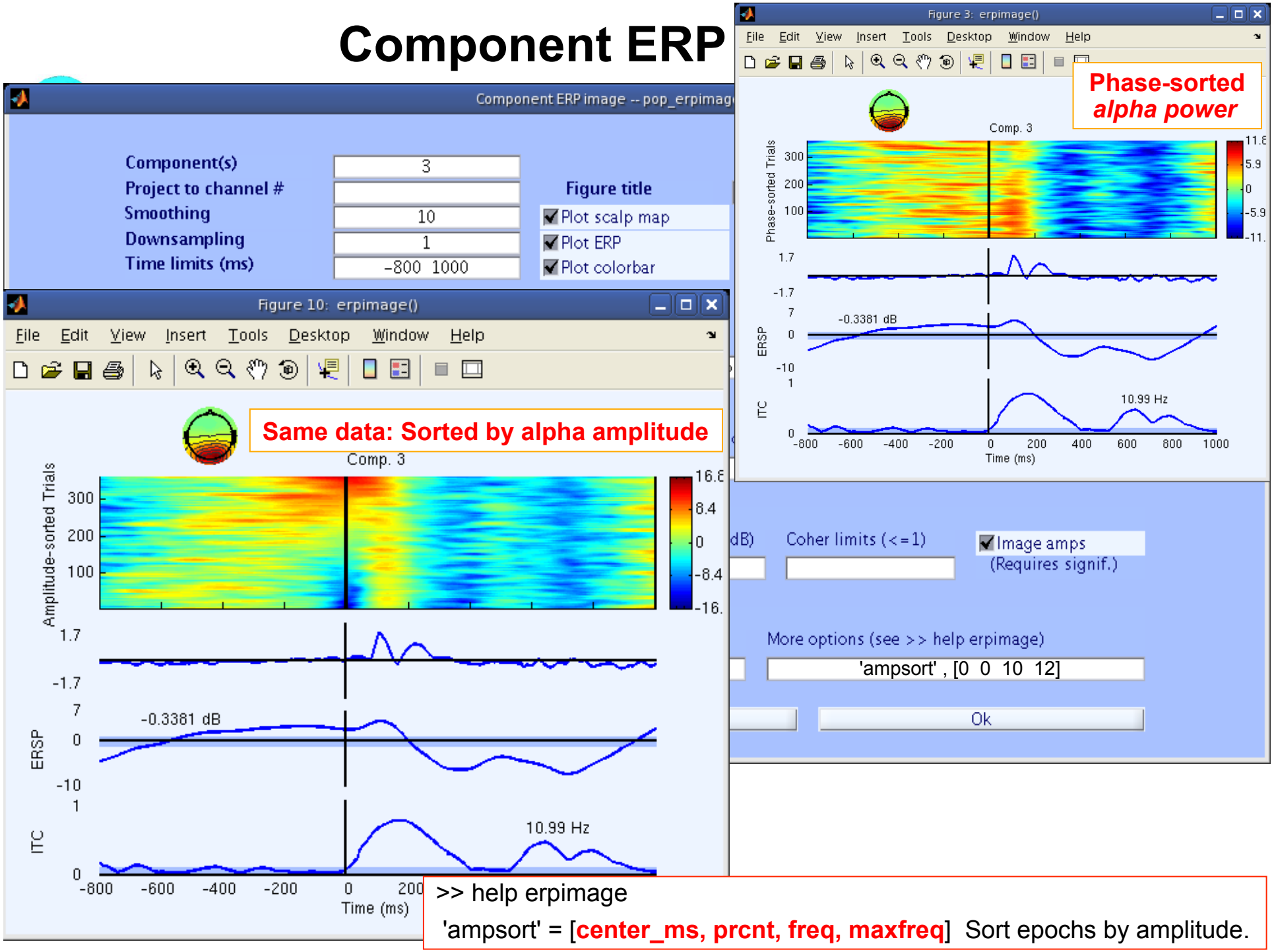
Phase-sorted image

Component ERP Images

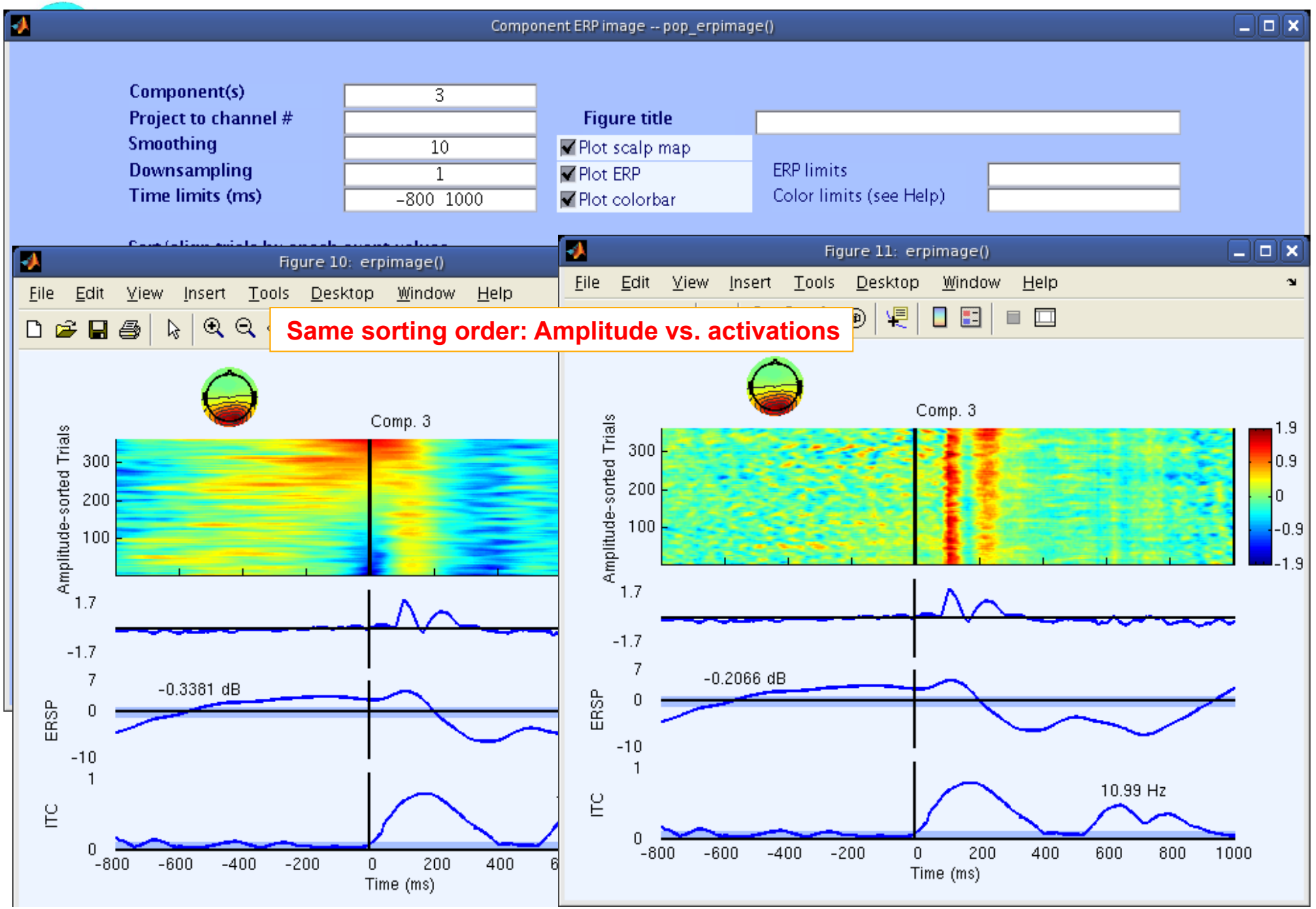


Phase-sorted alpha *power*

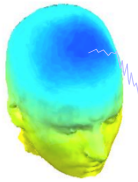
Component ERP



Component ERP Images



Evaluating ICA components



Plot 1

Component ERP

Plot 2

Component spectral power

Plot 3

Component ERP images

Plot 4

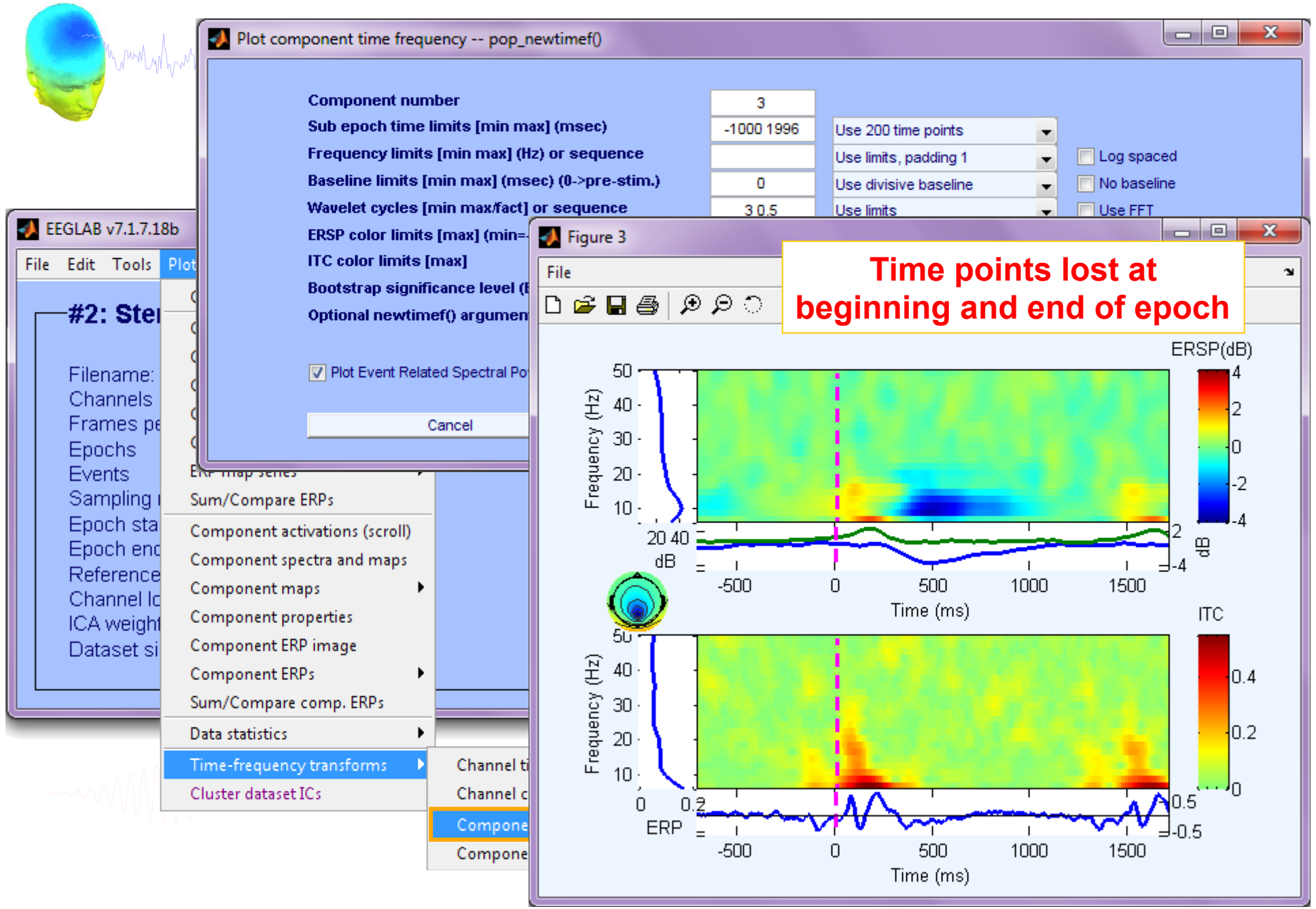
Component ERSP

Plot 5

Component cross coherence

Exercise...

Plot IC ERSP


Plot component time frequency -- pop_newtimef()
Component number
3
Sub epoch time limits [min max] (msec)
-1000 1996
Use 200 time points
Frequency limits [min max] (Hz) or sequence
Use limits, padding 1
Log spaced
Baseline limits [min max] (msec) (0->pre-stim.)
0
Use divisive baseline
No baseline
Wavelet cycles [min max/fact] or sequence
3 0.5
Use limits
Use FFT
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EEGLAB v7.1.7.18b
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Events
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ICA weight
Dataset si
Sum/Compare ERPs
Component activations (scroll)
Component spectra and maps
Component maps
Component properties
Component ERP image
Component ERPs
Sum/Compare comp. ERPs
Data statistics
Time-frequency transforms
Cluster dataset ICs
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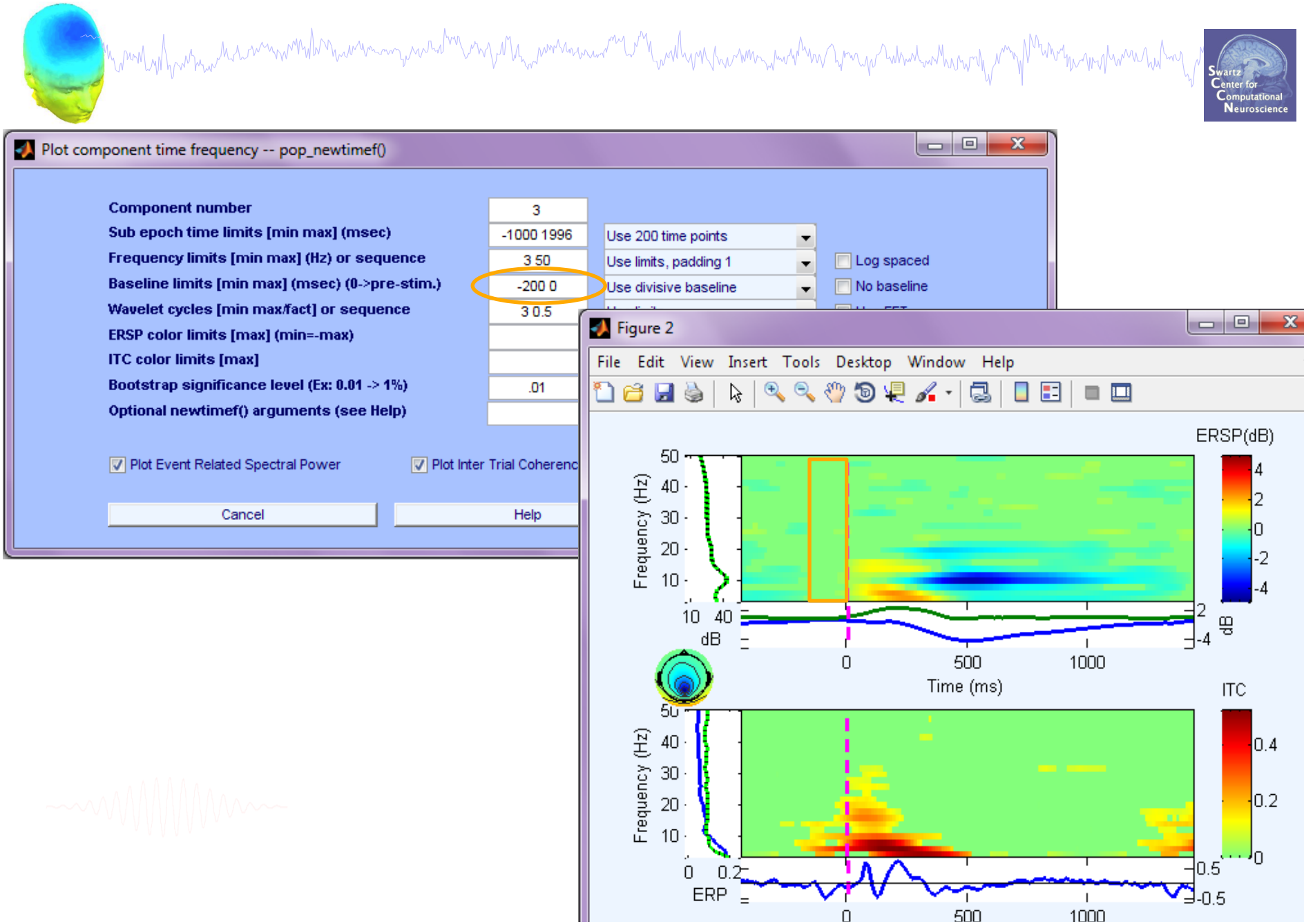
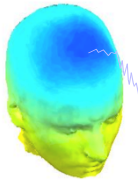
Channel c
Compone
Compone
Figure 3
File
Time points lost at beginning and end of epoch
ERSP(dB)
Frequency (Hz)
50
40
30
20
10
20 40
dB
4
2
0
-2
-4
-500
0
500
1000
1500
Time (ms)
ITC
0.4
0.2
0
0 0.2
ERP
0.5
-0.5

Plot IC ERSP


Plot component time frequency -- pop_newtimef()
Component number
3
Sub epoch time limits [min max] (msec)
-1000 1996
Use 200 time points
Frequency limits [min max] (Hz) or sequence
3 50
Use limits, padding 1
Log spaced
Baseline limits [min max] (msec) (0->pre-stim.)
-200 0
Use divisive baseline
No baseline
Wavelet cycles [min max/fact] or sequence
3 0.5
ERSP color limits [max] (min=-max)
ITC color limits [max]
Bootstrap significance level (Ex: 0.01 -> 1%)
.01
Optional newtimef() arguments (see Help)
Plot Event Related Spectral Power
Plot Inter Trial Coherenc
Cancel
Help
Figure 2
File Edit View Insert Tools Desktop Window Help
ERSP(dB)
Frequency (Hz)
Time (ms)
ITC
ERP
dB

Exercise



- **ALL**
  - Load stern_125Hz.set, epoch on Memorize letters, reject noise

- **Novice**
  - From the GUI, plot component ERPs with maps
  - Pick an interesting IC and plot an ERP image of it
  - Try sorting by RT or phase, is there any relationship to the IC activation pattern? What about power in a frequency band of choice?

- **Intermediate**
  - Plot ERSPs for selected ICs
    ~ Compare FFT, wavelet(s), and multi-taper methods for ERSP