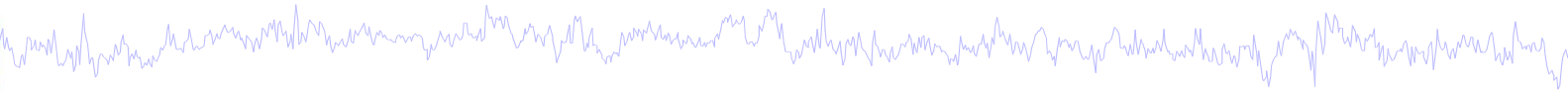
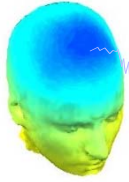
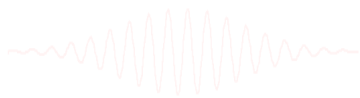


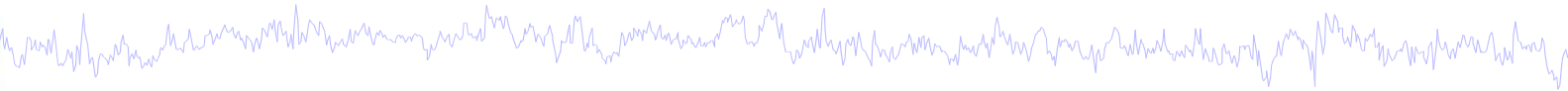
Evaluate ICA decomposition and artifacts



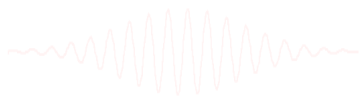
- 1) Evaluate IC Decomposition**
- 2) IC Properties**
- 3) Identify Artifacts**
- 4) IC Selection**
- 5) Intro to ICLabel Website**



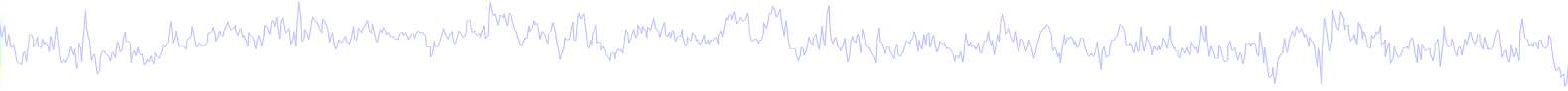
Evaluate ICA decomposition and artifacts



- 1) Evaluate IC Decomposition**
- 2) IC Properties**
- 3) Identify Artifacts**
- 4) IC Selection**
- 5) Intro to ICLabel Website**



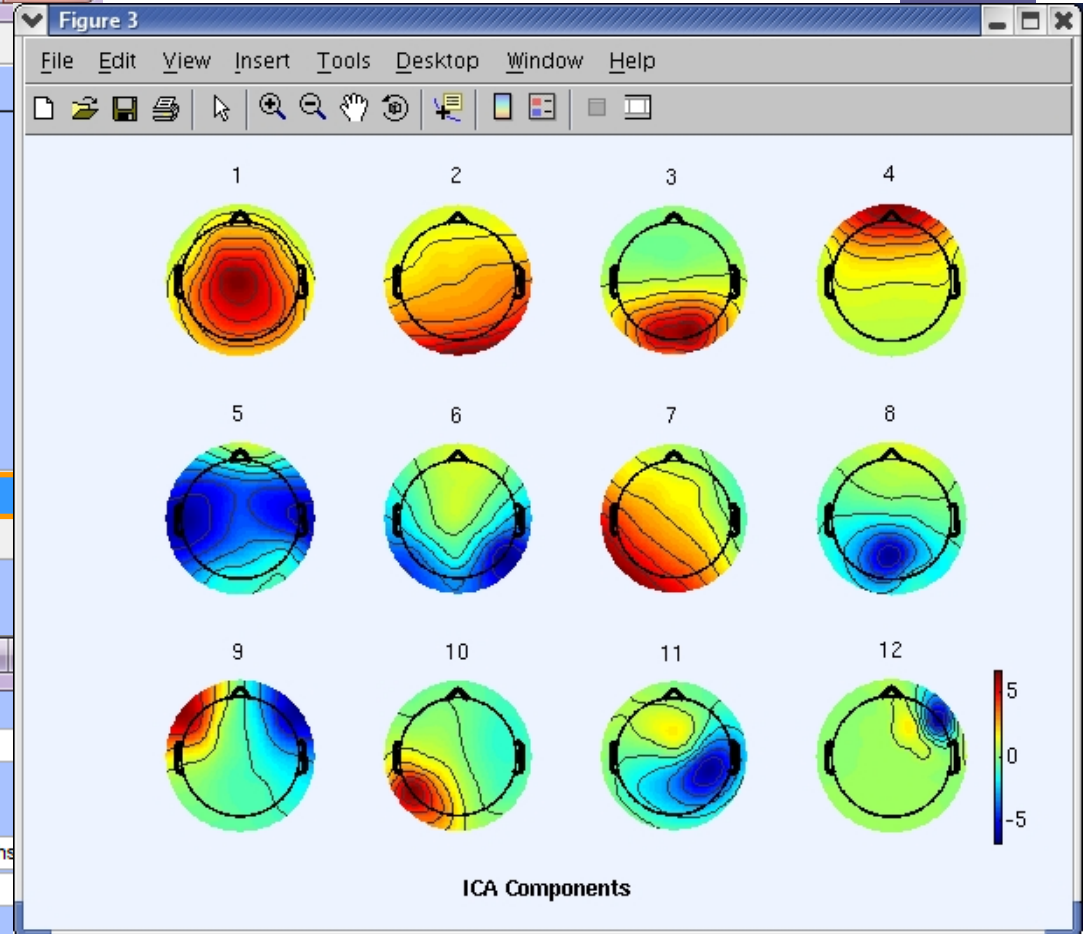
Plot ICA scalp maps



EEGLAB v7.1.7.18b

File Edit Tools **Plot** Study Datasets Help

- 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**
 - In 2-D
 - In 3-D
- Component properties
- Component ERP image
- Component ERPs



Plot component scalp maps in 2-D -- pop_topoplot()

Component numbers:

(negate index to invert component polarity; NaN -> empty subplot; Ex: [-1 NaN 3])

Plot title:

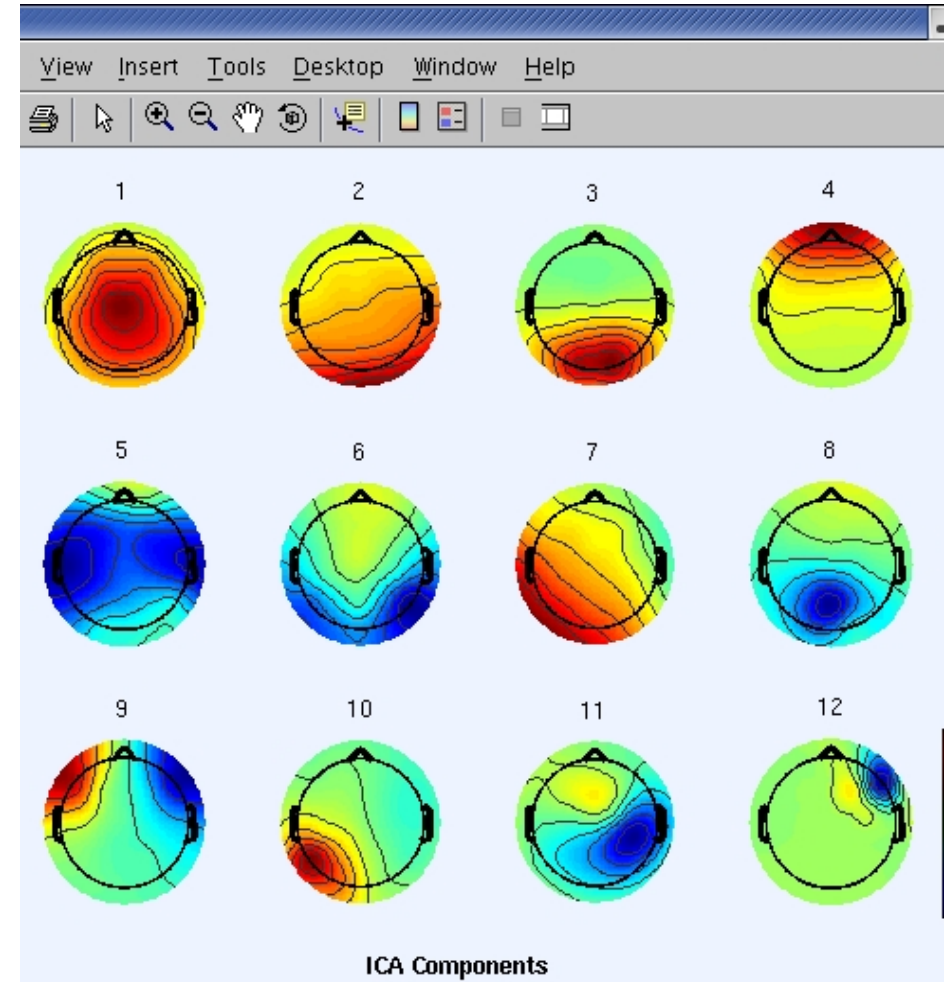
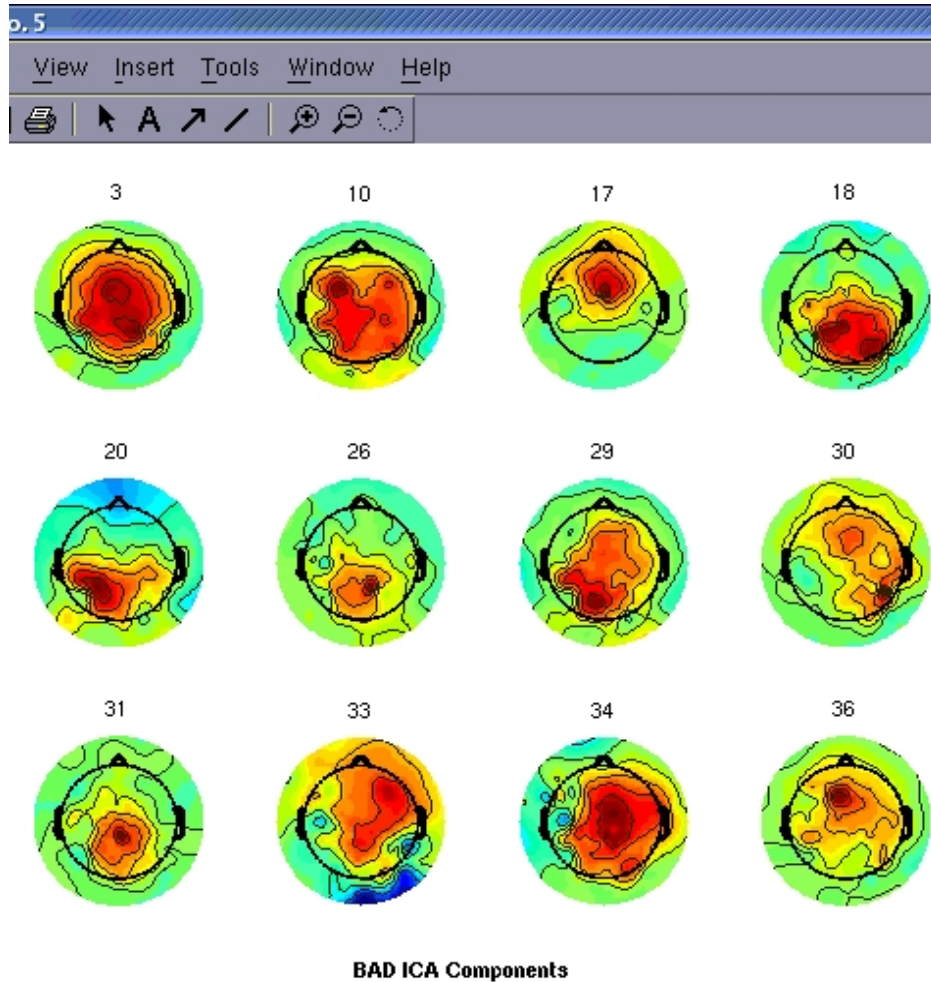
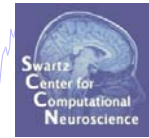
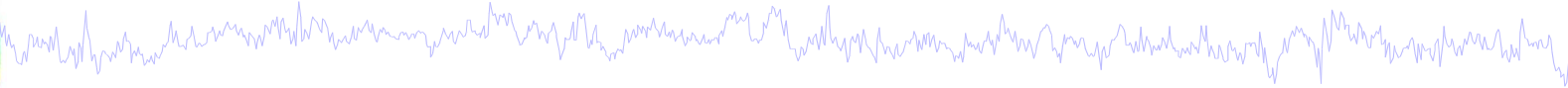
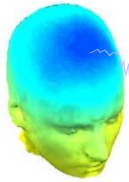
Plot geometry (rows,col):

Plot associated dipole(s) (if present):

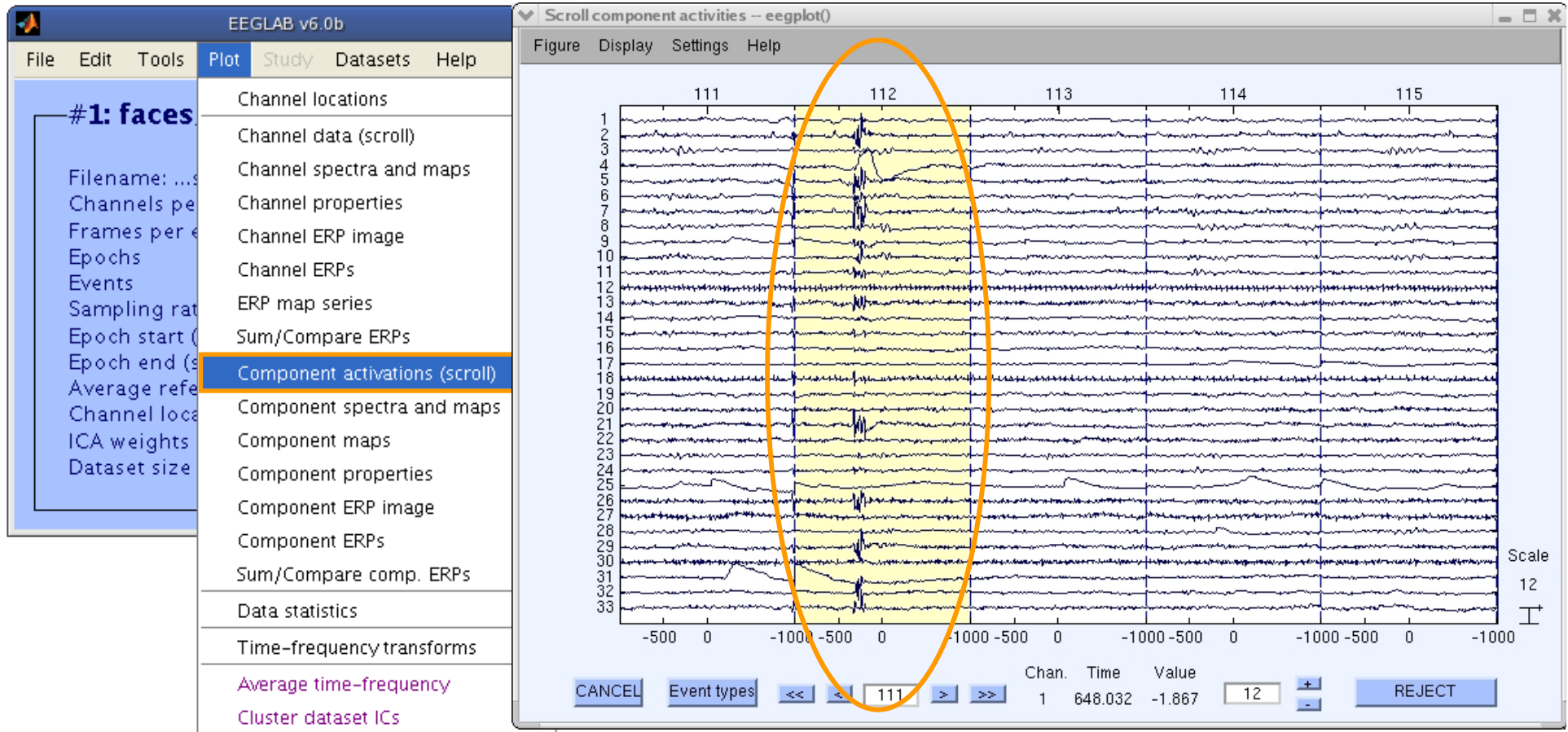
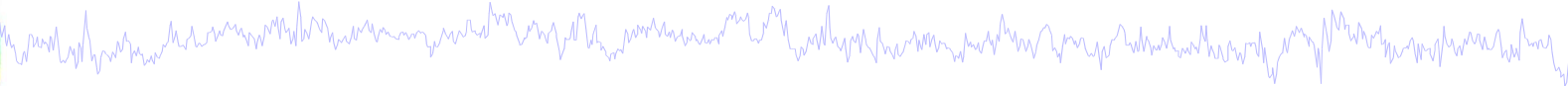
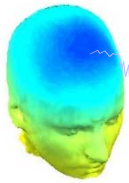
-> Additional topoplot() (and dipole) options (see Help)

Cancel Help Ok

Compare 'good' and 'bad' scalp maps

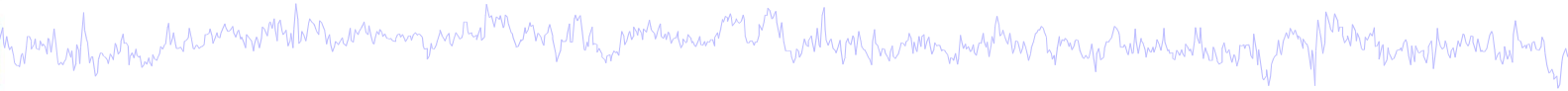


Scroll component activities

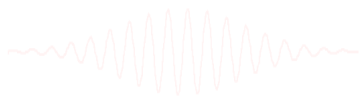


**Time periods that are not independent across ICs
should be removed and ICA run again for better decomposition**

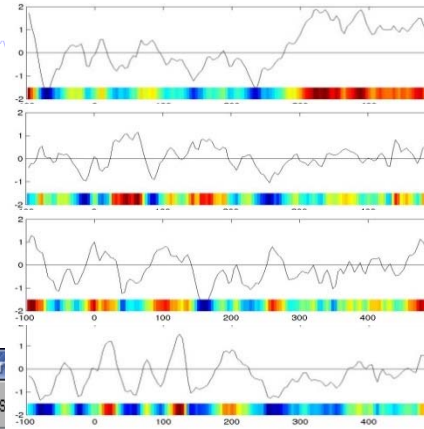
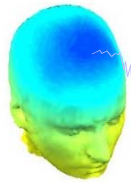
Evaluate ICA decomposition and artifacts



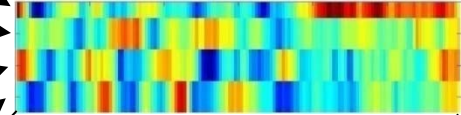
- 1) Evaluate IC Decomposition
- 2) IC Properties
- 3) Identify Artifacts
- 4) IC Selection
- 5) Intro to ICLabel Website



Plot ICA component properties



ERP Image



EEGLAB v6.0b

File Edit Tools **Plot** Study Datasets Help

#1: faces

- 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
- Time-frequency transforms
- Average time-frequency
- Cluster dataset ICs

Component 3 properties

File Edit View Ins

Component 3 map

Component 3 activity (global offset 0.079)

Activity power spectrum

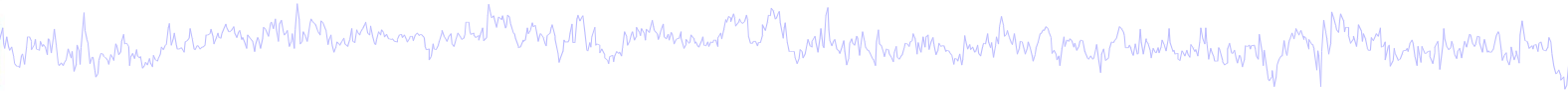
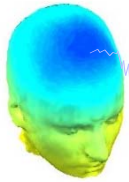
Cancel Values ACCEPT HELP OK

Component properties -- po

Component number to plot:

Cancel Help OK

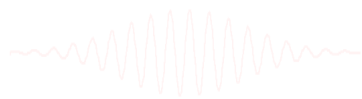
Reviewing component properties



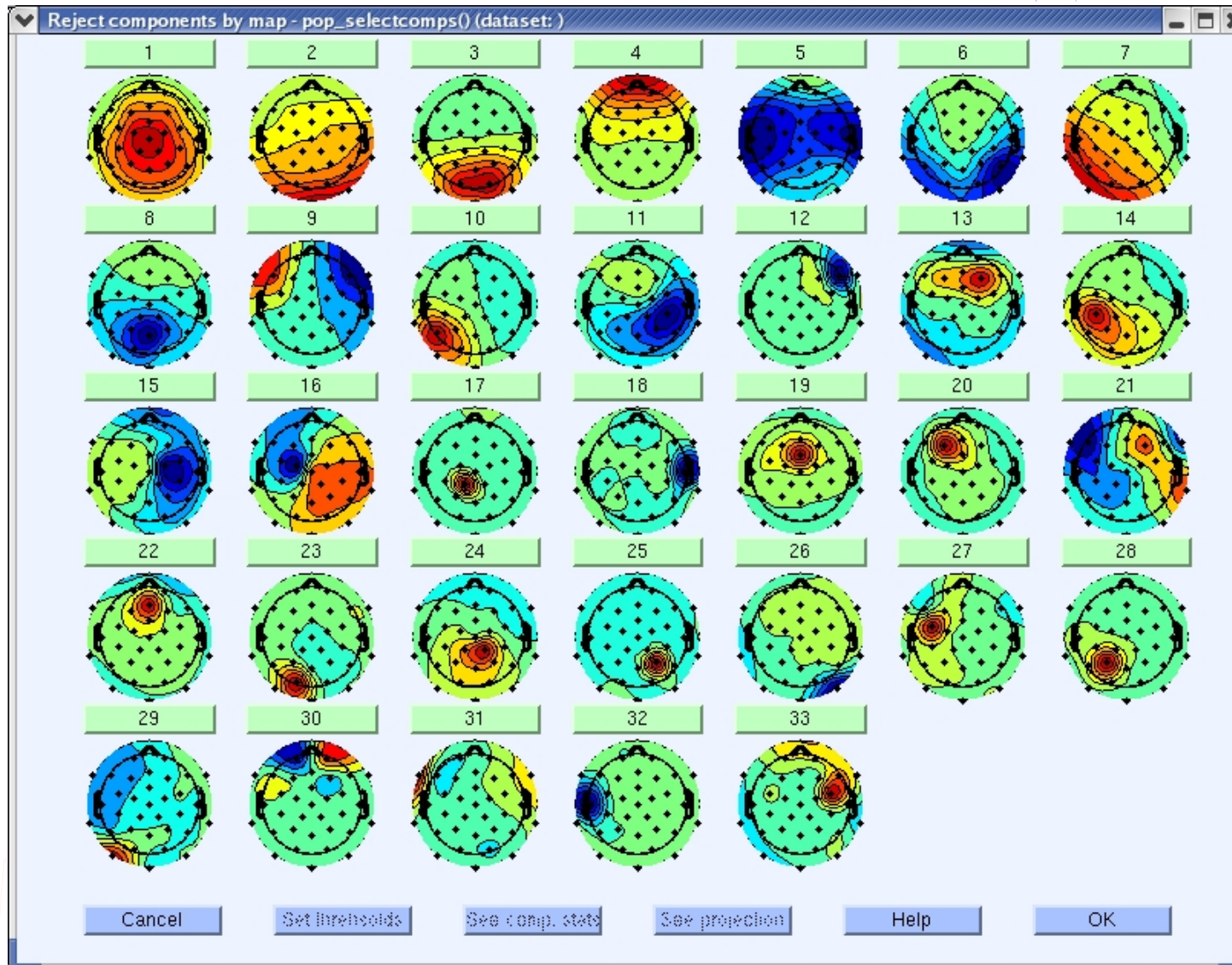
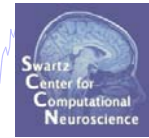
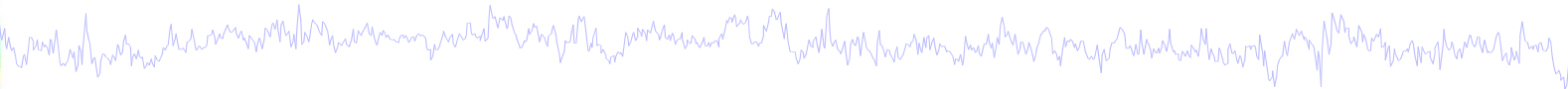
EEGLAB v7.1.7.18b

File Edit **Tools** Plot Study Datasets Help

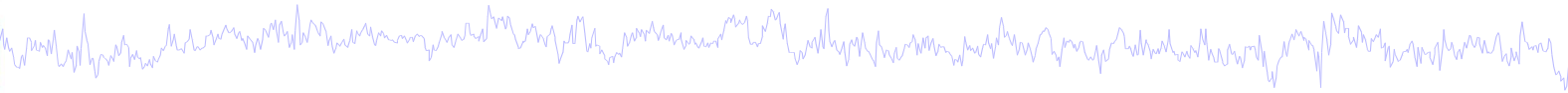
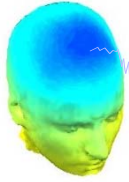
- Change sampling rate
- Filter the data
- Re-reference
- Interpolate electrodes
- Reject continuous data by eye
- Extract epochs
- Remove baseline
- Run ICA
- Remove components
- Automatic channel rejection
- Automatic epoch rejection
- Reject data epochs
- Reject data using ICA**
 - Reject components by map**
 - Reject data (all methods)
 - Reject by inspection
 - Reject extreme values
 - Reject by linear trend/variance
 - Reject by probability
 - Reject by kurtosis
 - Reject by spectra
 - Export marks to data reject
 - Reject marked epochs
- Locate dipoles using DIPFIT 2.x
- Peak detection using EEG toolbox
- FMRIB Tools
- Locate dipoles using LORETA



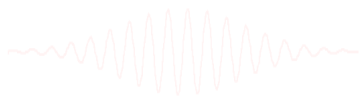
Component scalp maps/properties

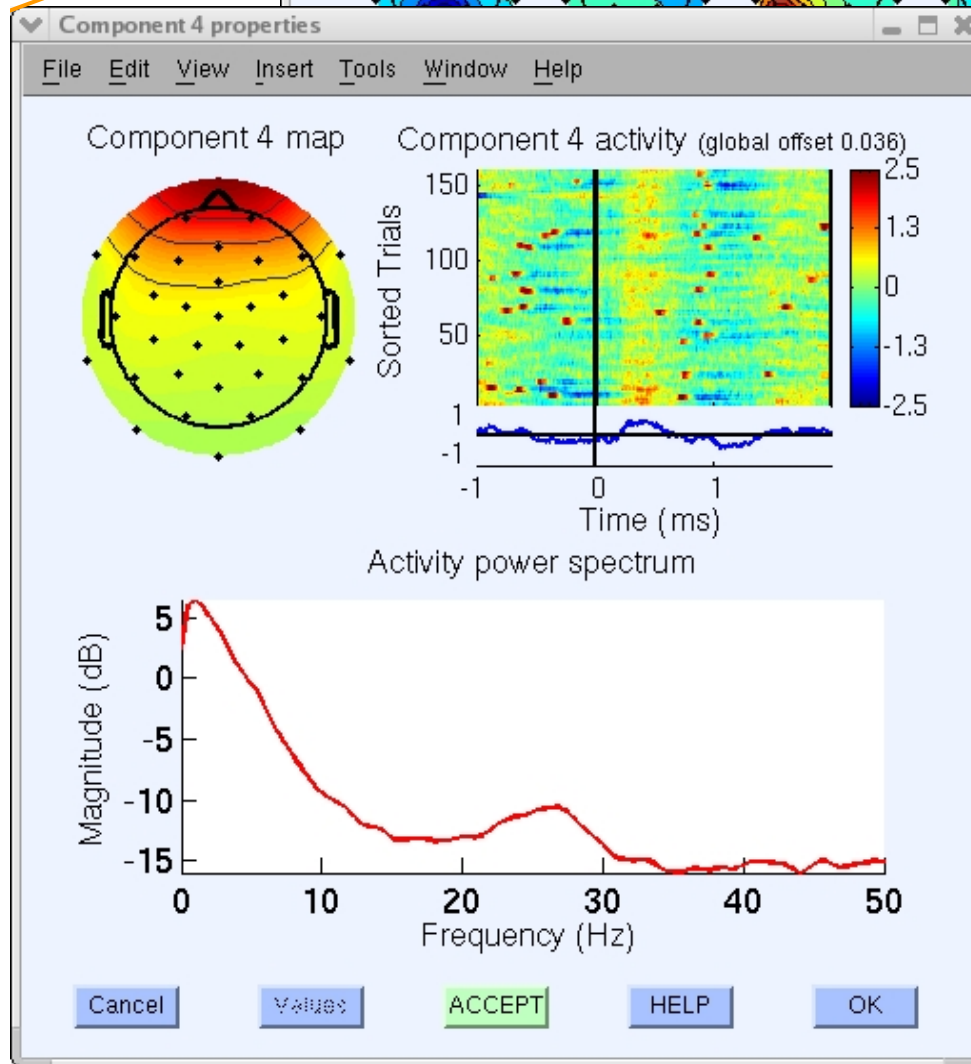
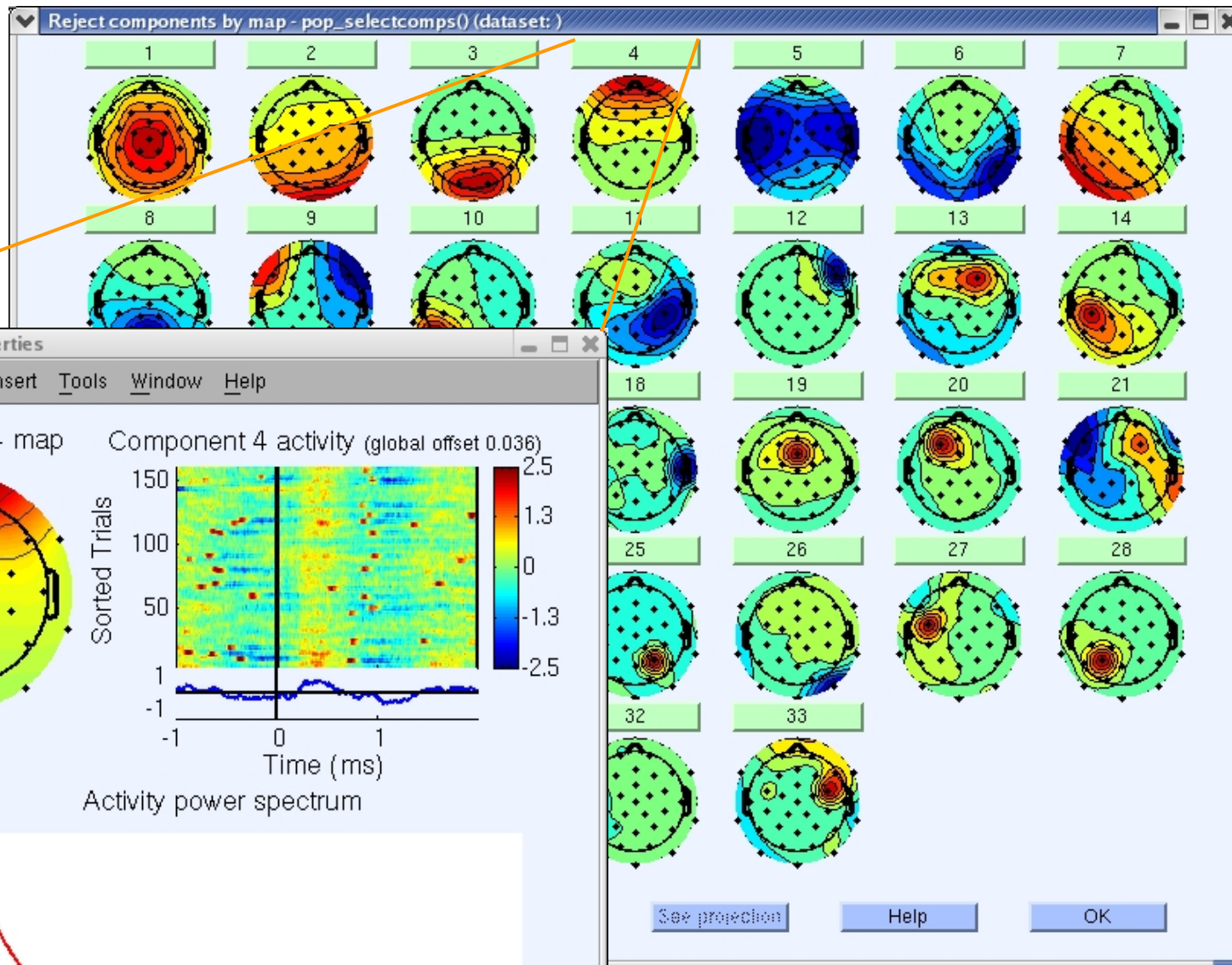


Evaluate ICA decomposition and artifacts

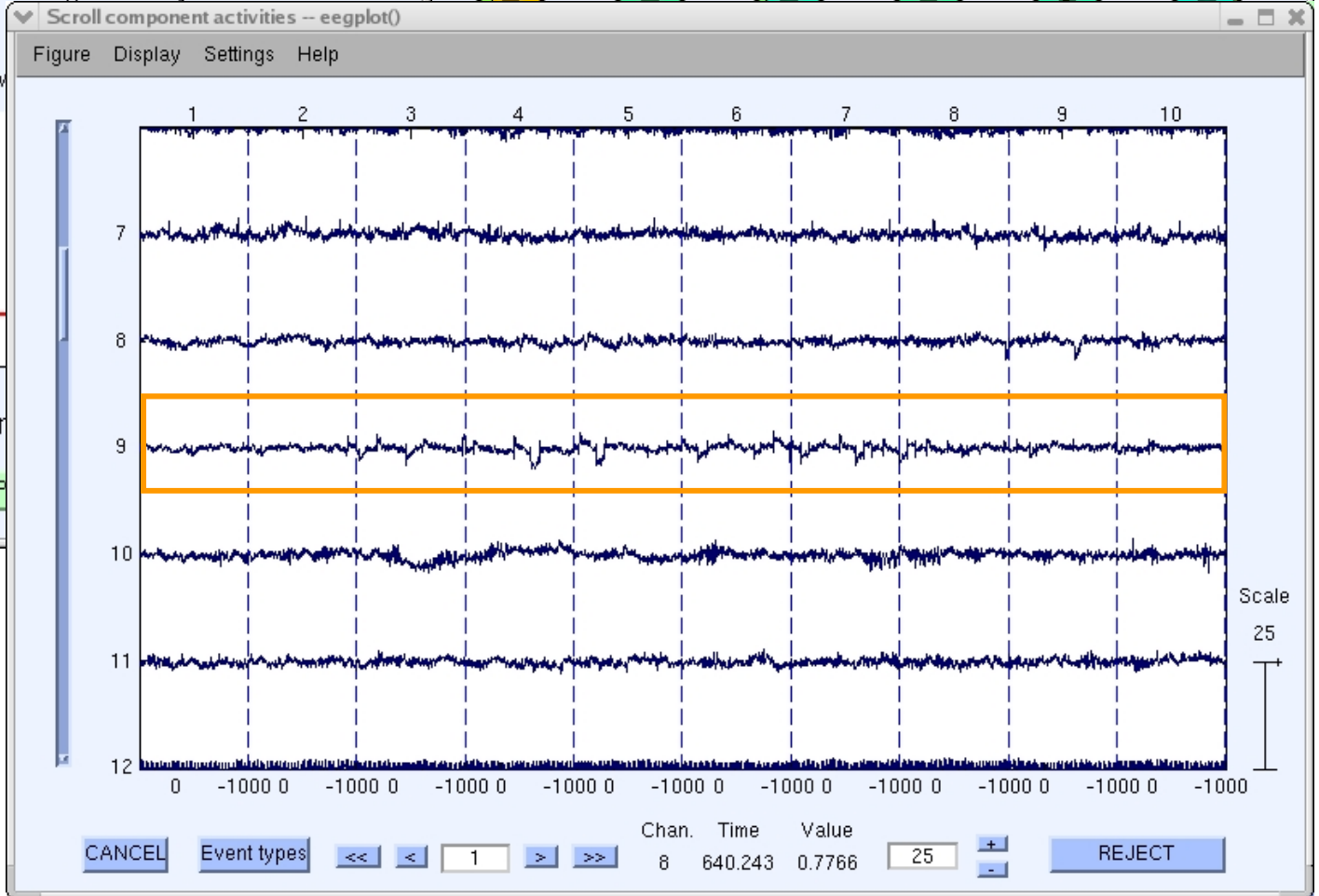
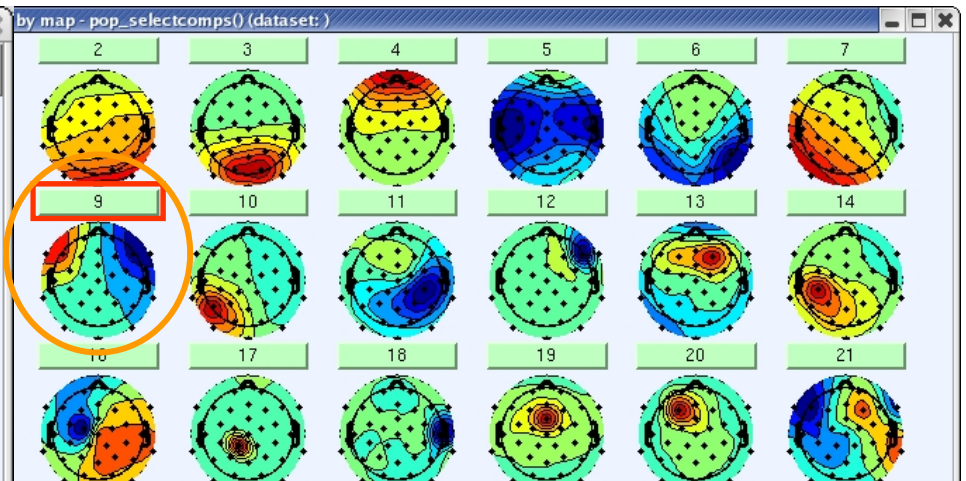
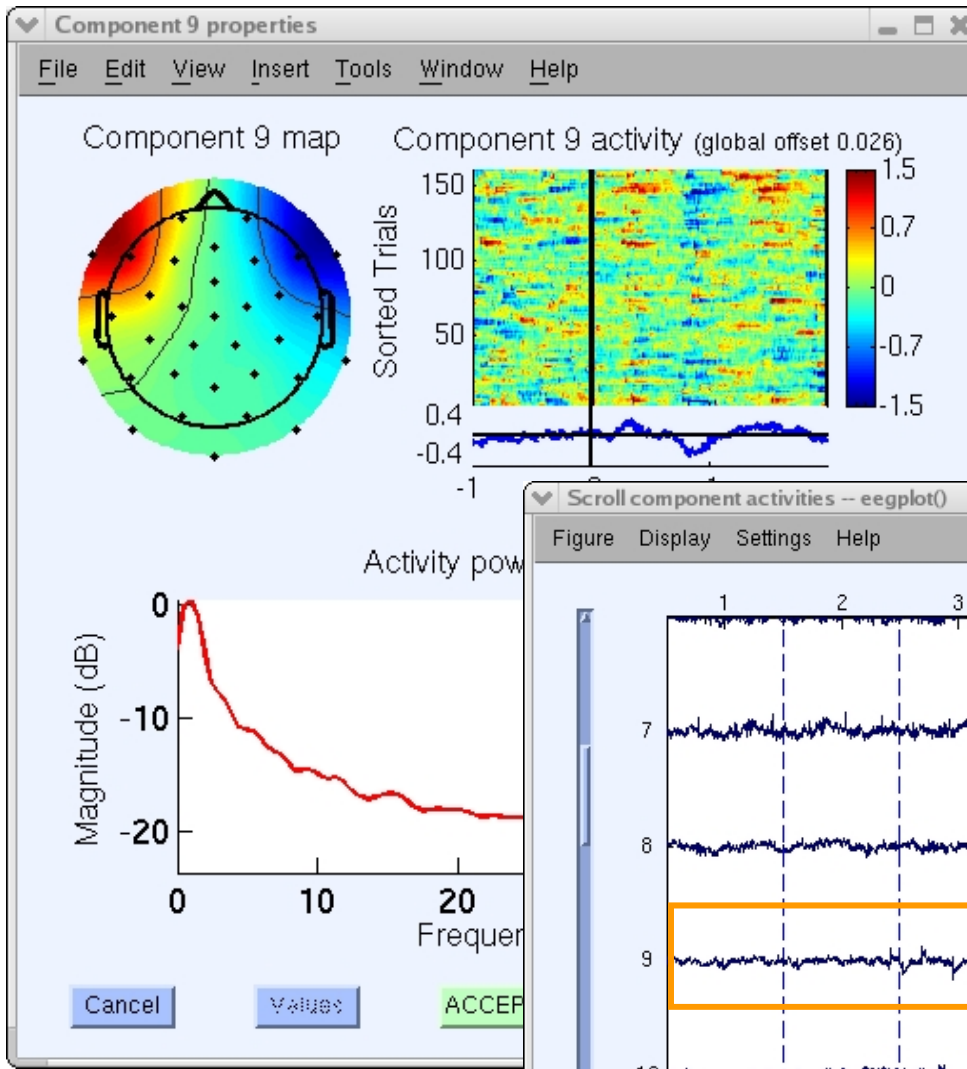


- 1) Evaluate IC Decomposition
- 2) IC Properties
- 3) Identify Artifacts
- 4) IC Selection
- 5) Intro to ICLabel Website

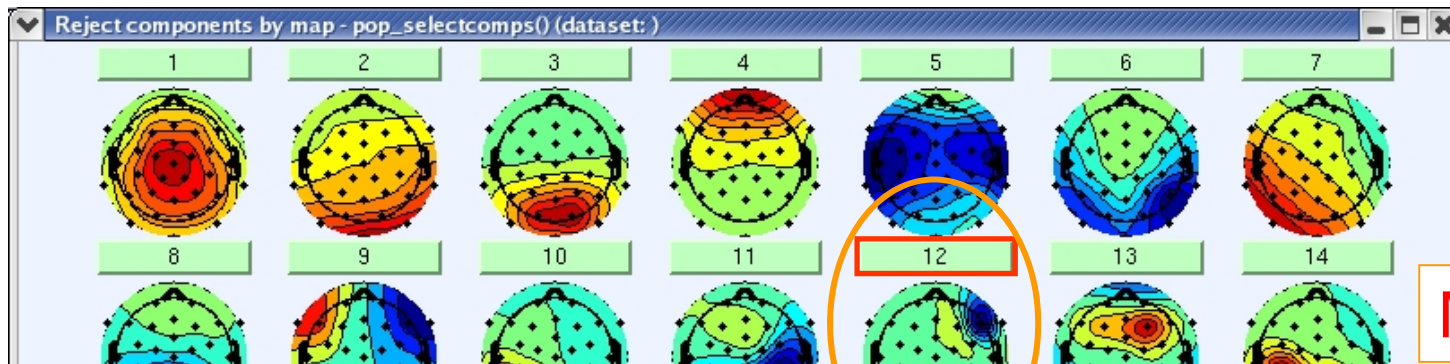




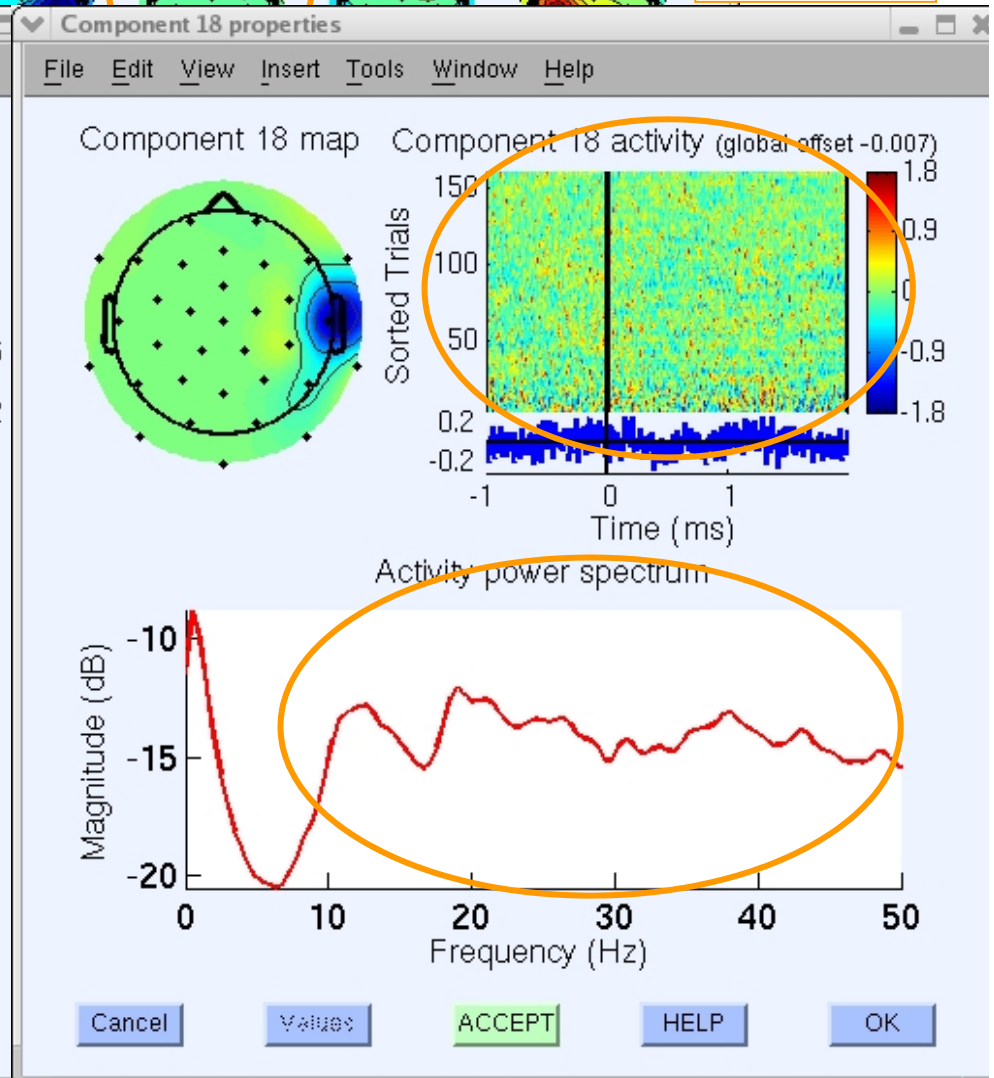
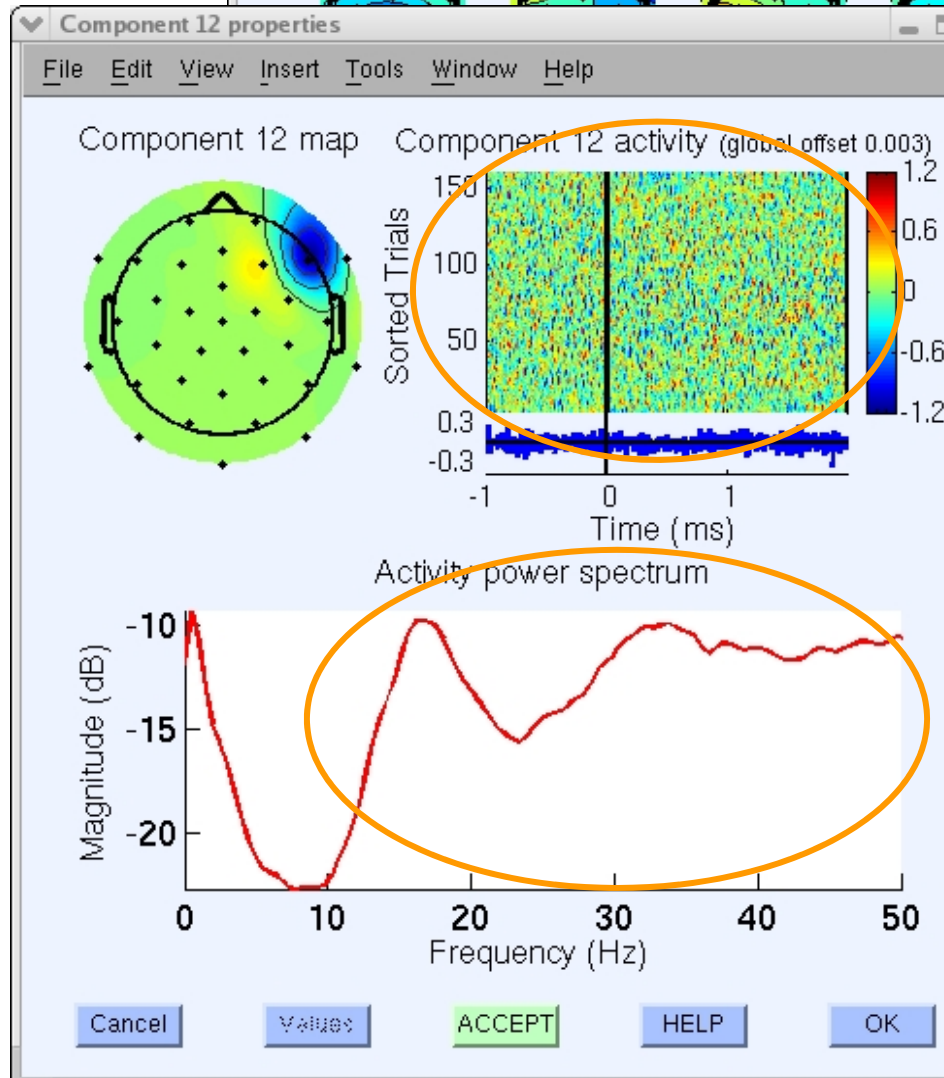
Eye blink component

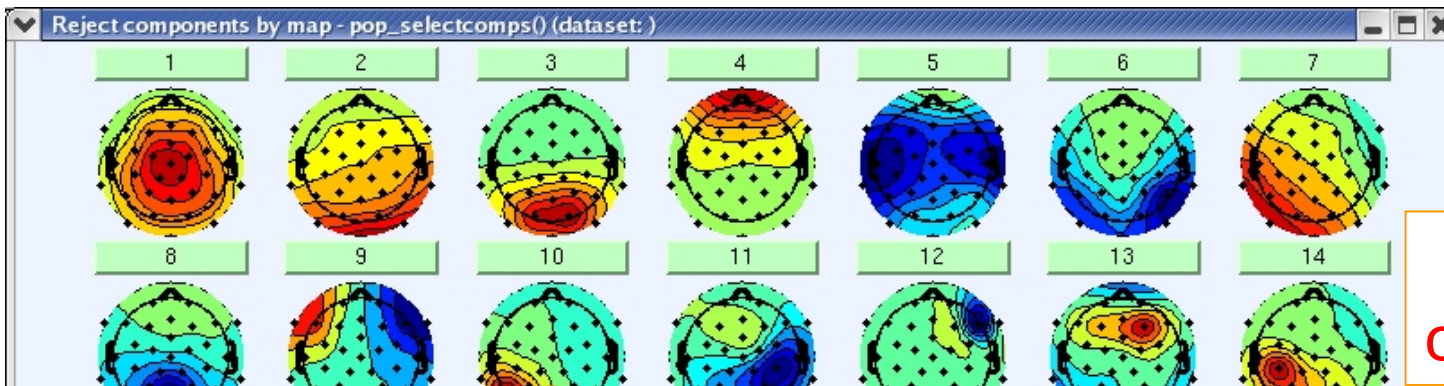


Lateral eye movement

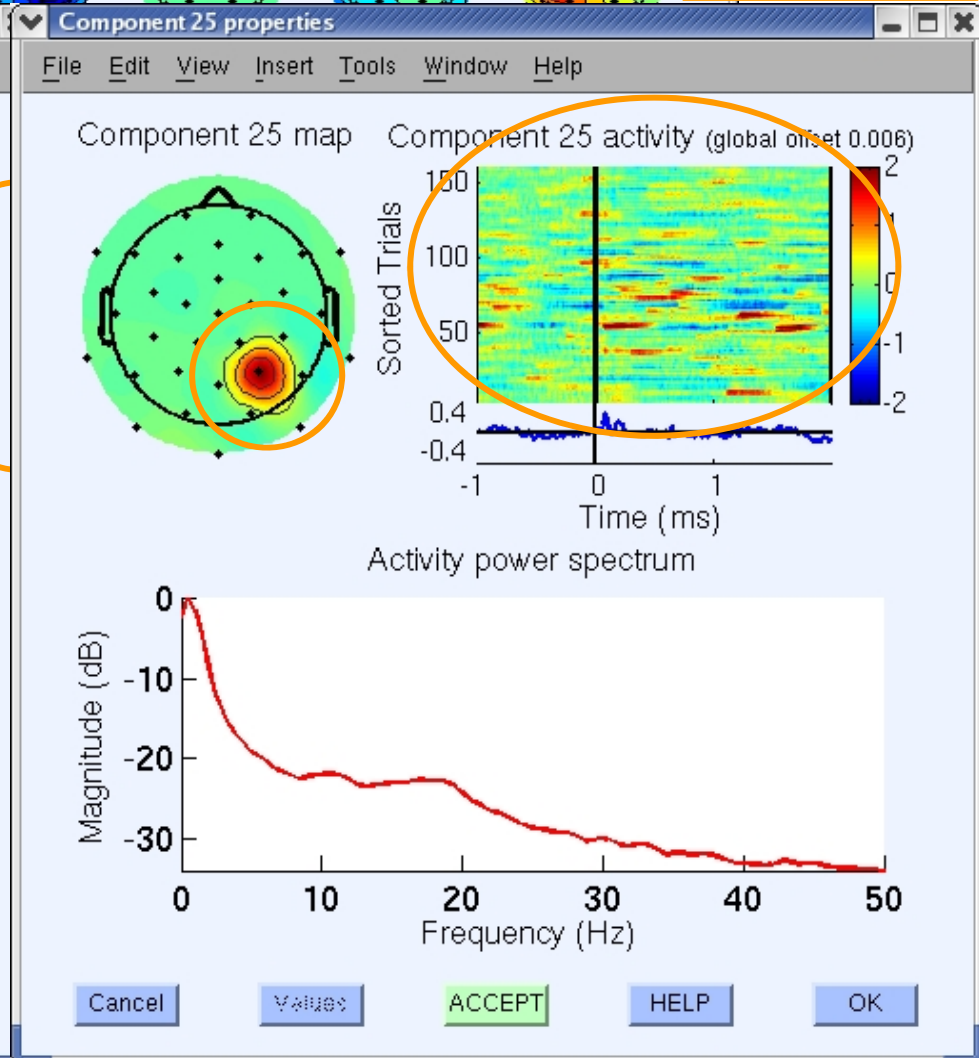
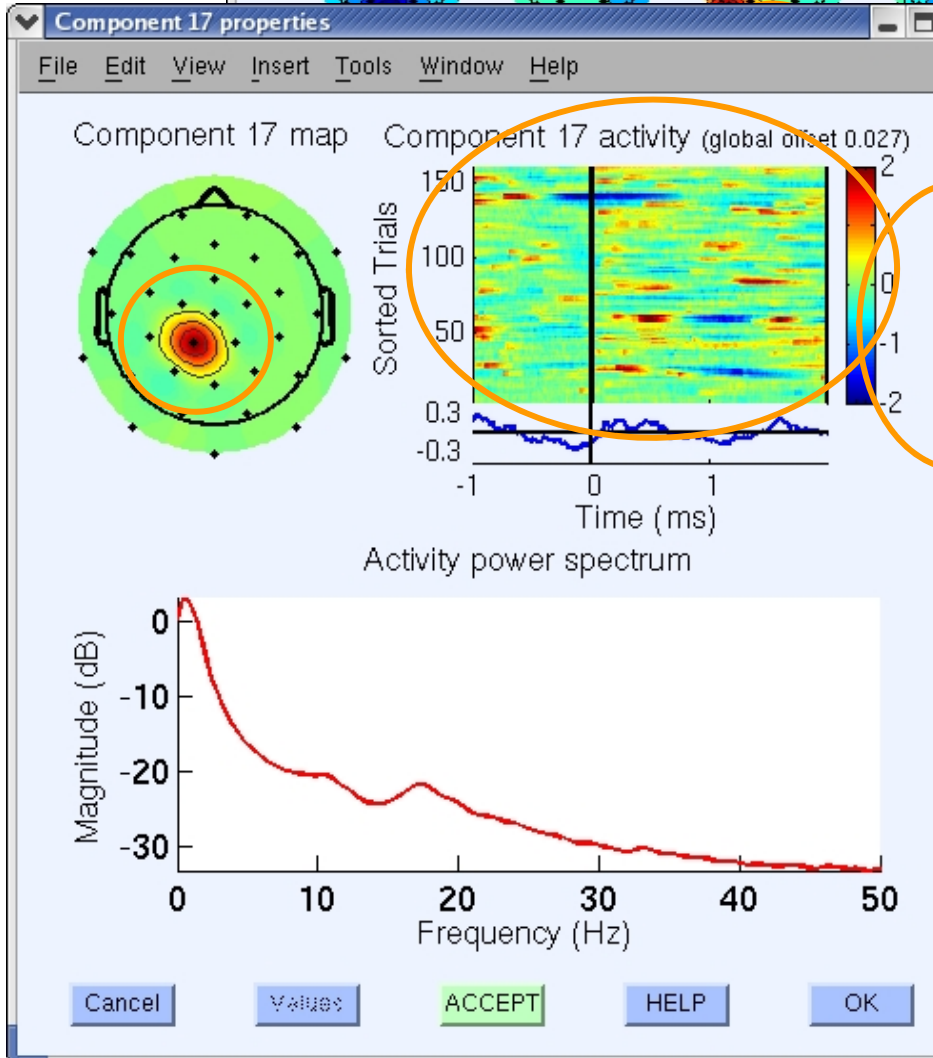


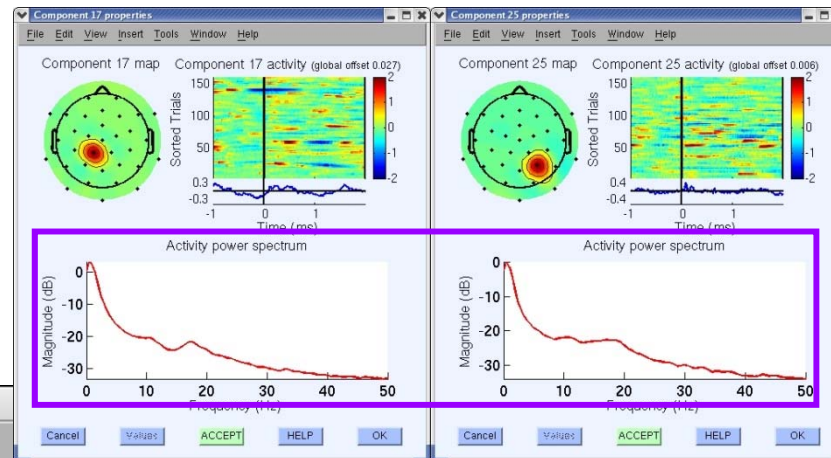
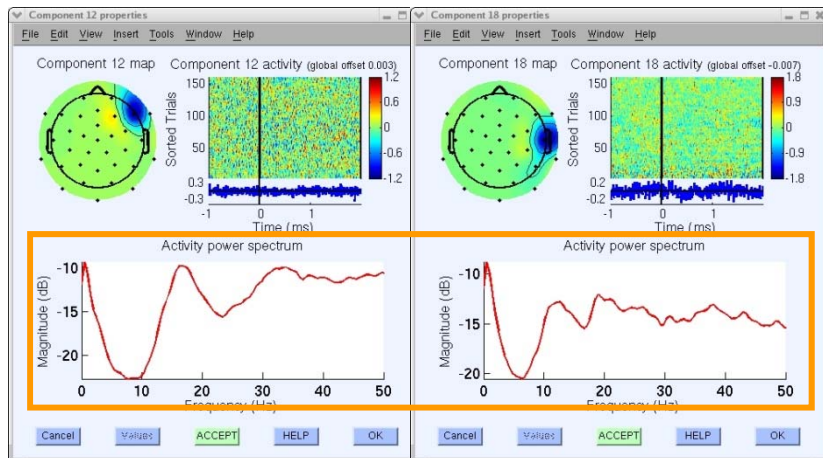
Muscle





Bad channels

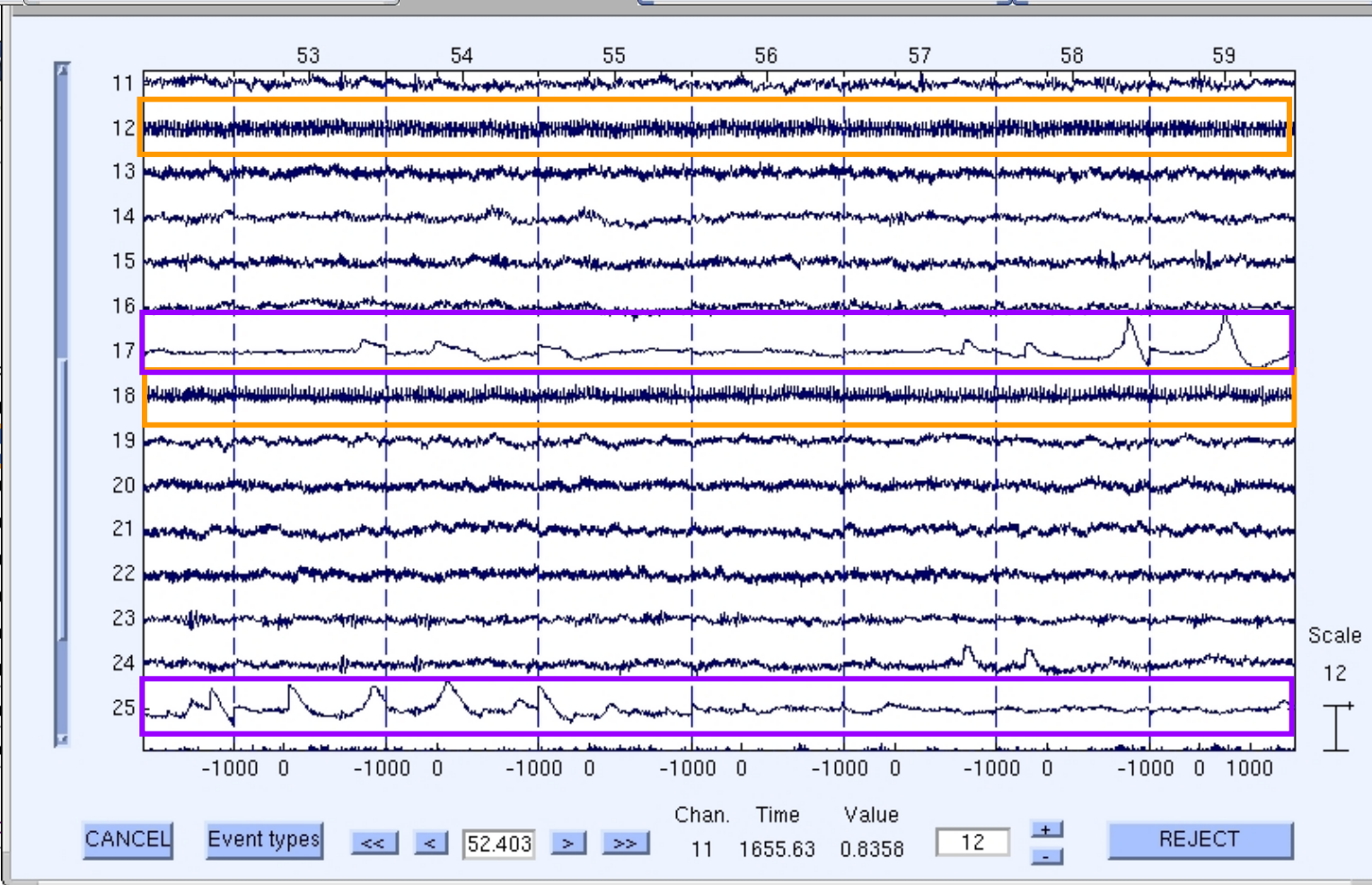


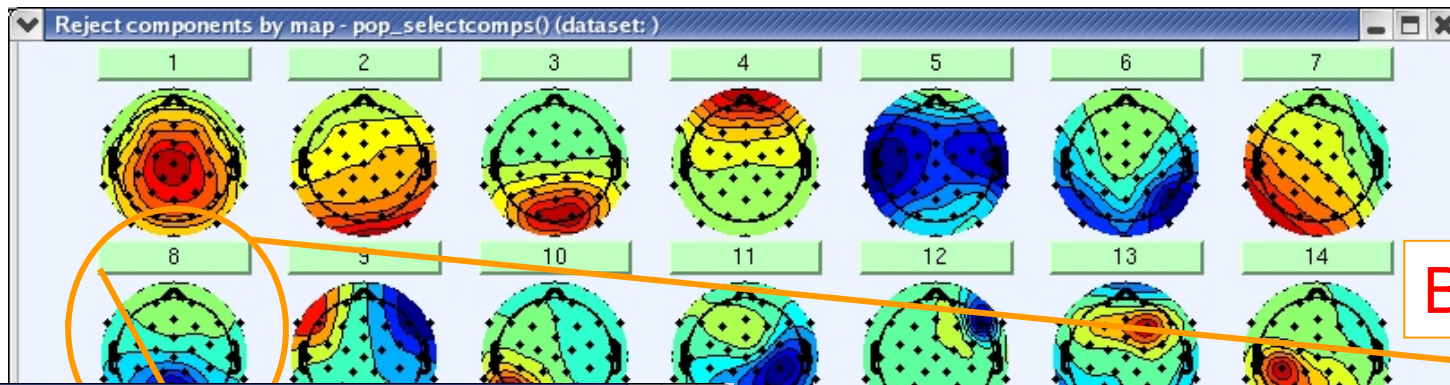


EEGLAB v...
 File Edit Tools Plot Study

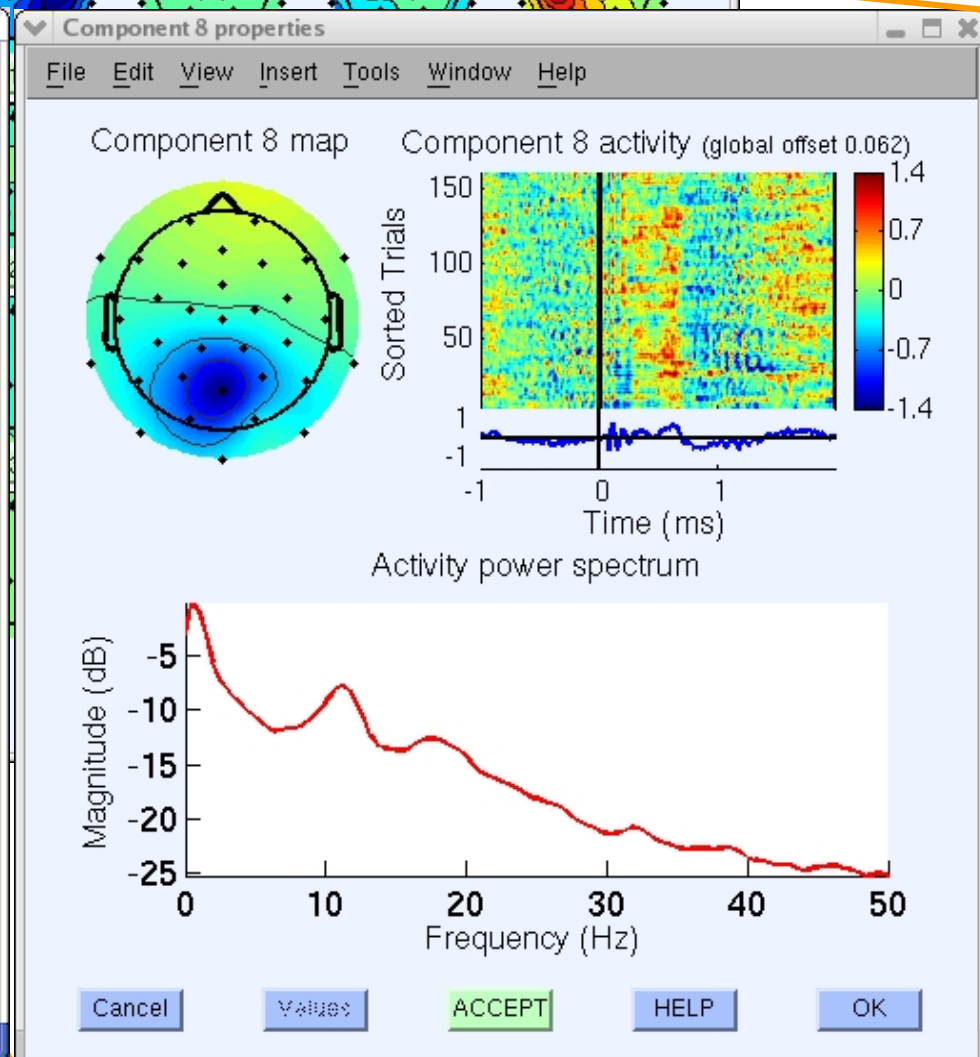
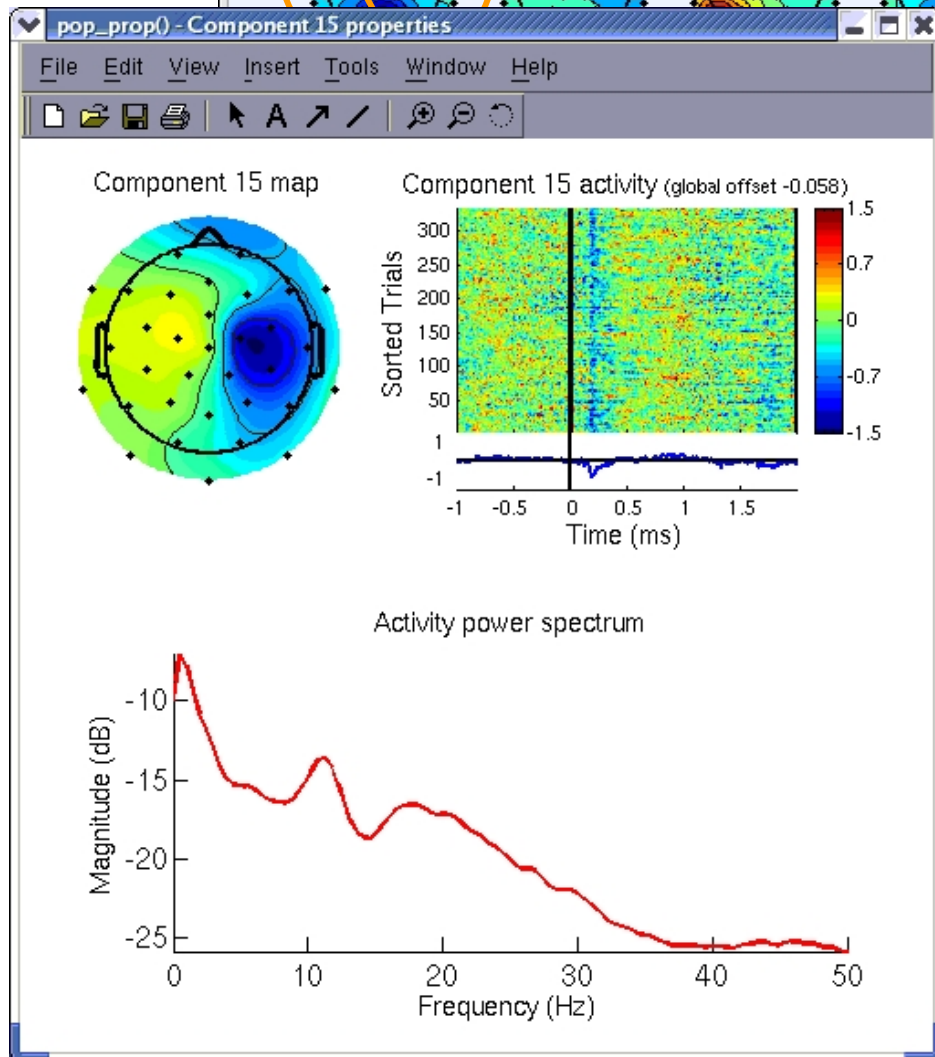
#1: faces

Filename: ...
 Channels per ...
 Frames per e...
 Epochs
 Events
 Sampling rat...
 Epoch start (...)
 Epoch end (s...)
 Average refe...
 Channel loca...
 ICA weights
 Dataset size

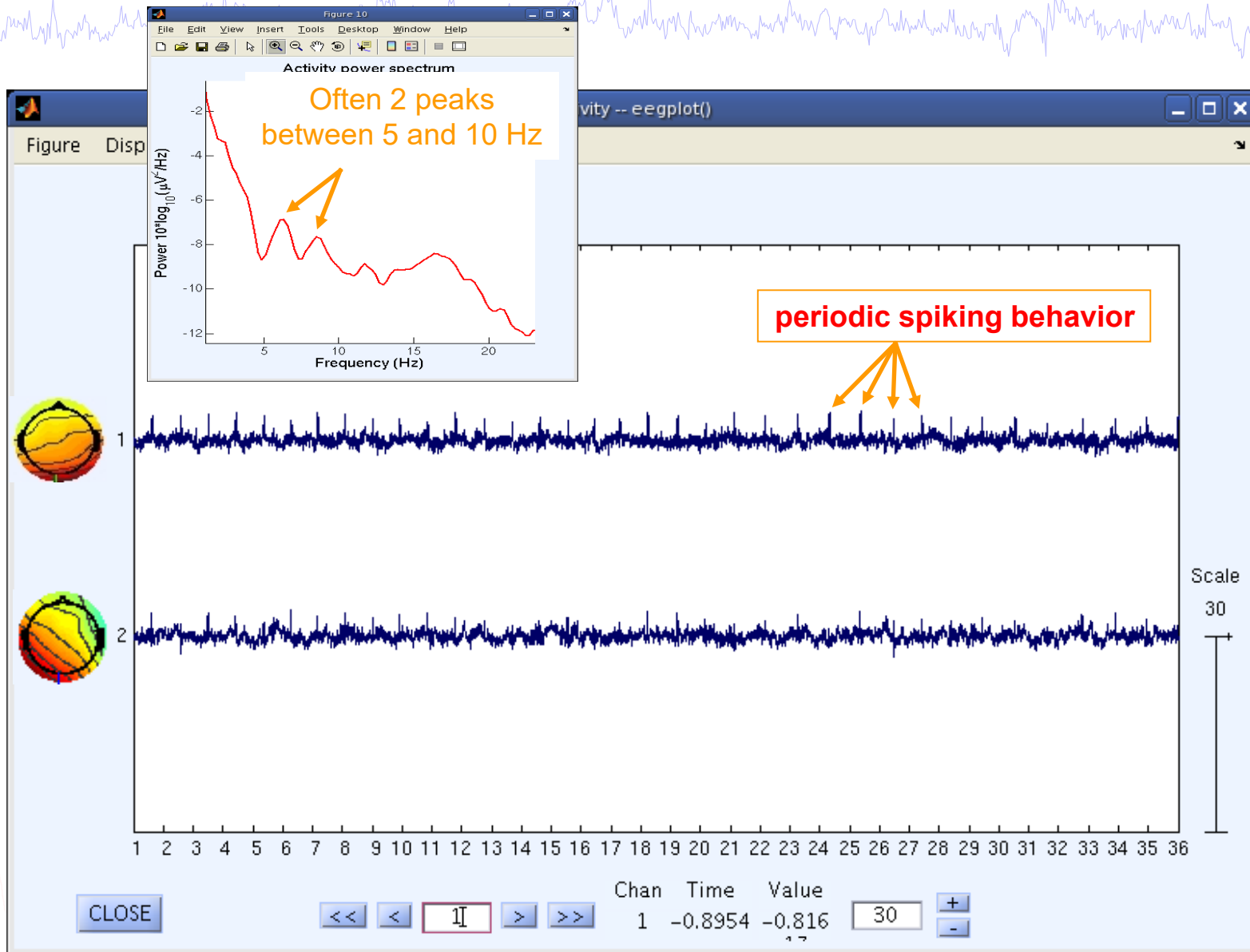




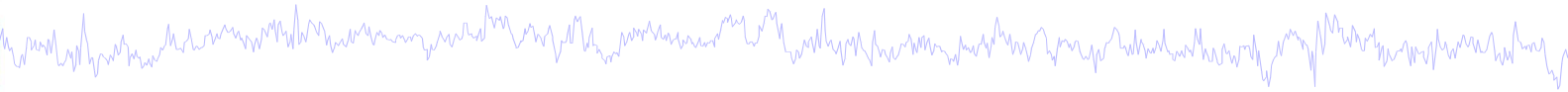
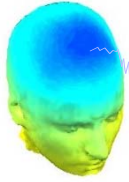
Brain ICs



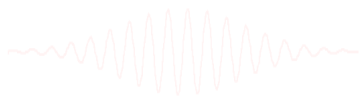
Pulse artifacts



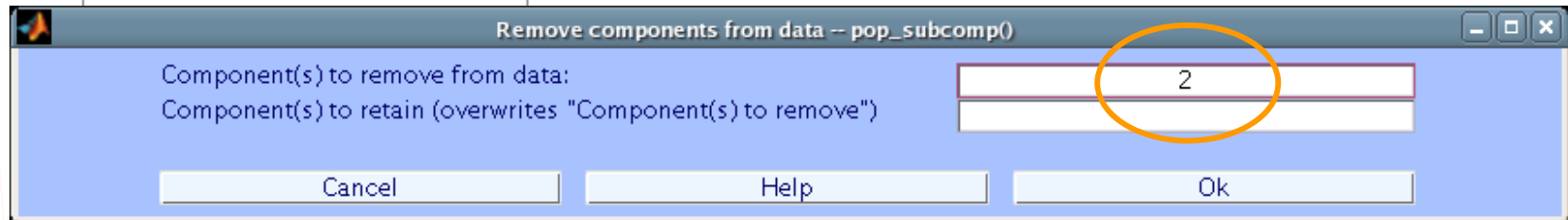
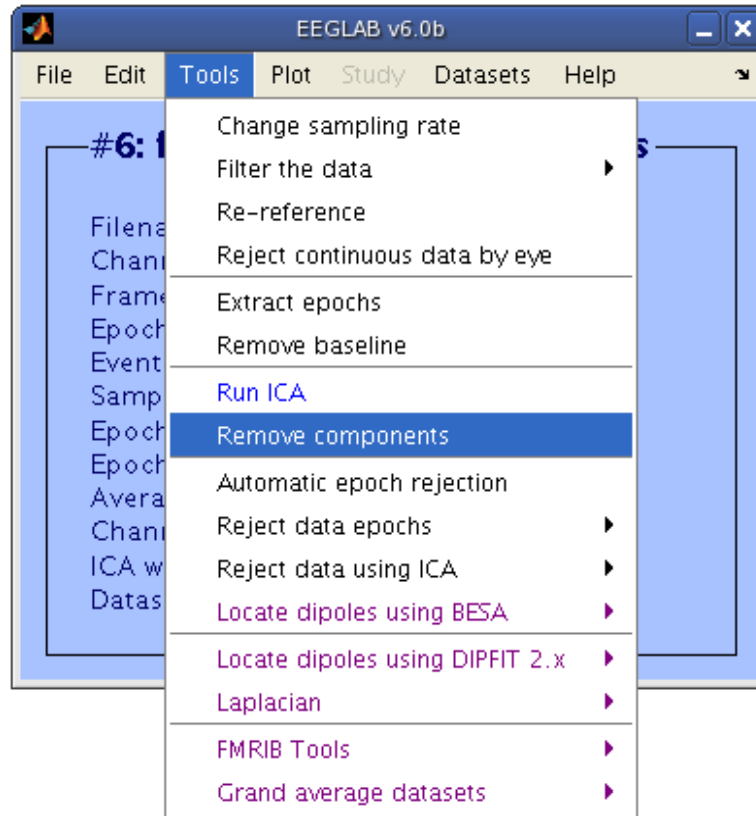
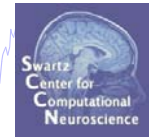
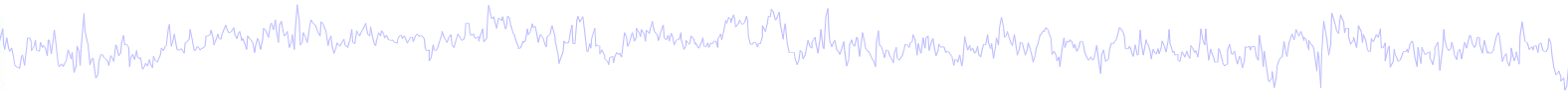
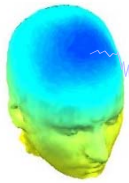
Evaluate ICA decomposition and artifacts



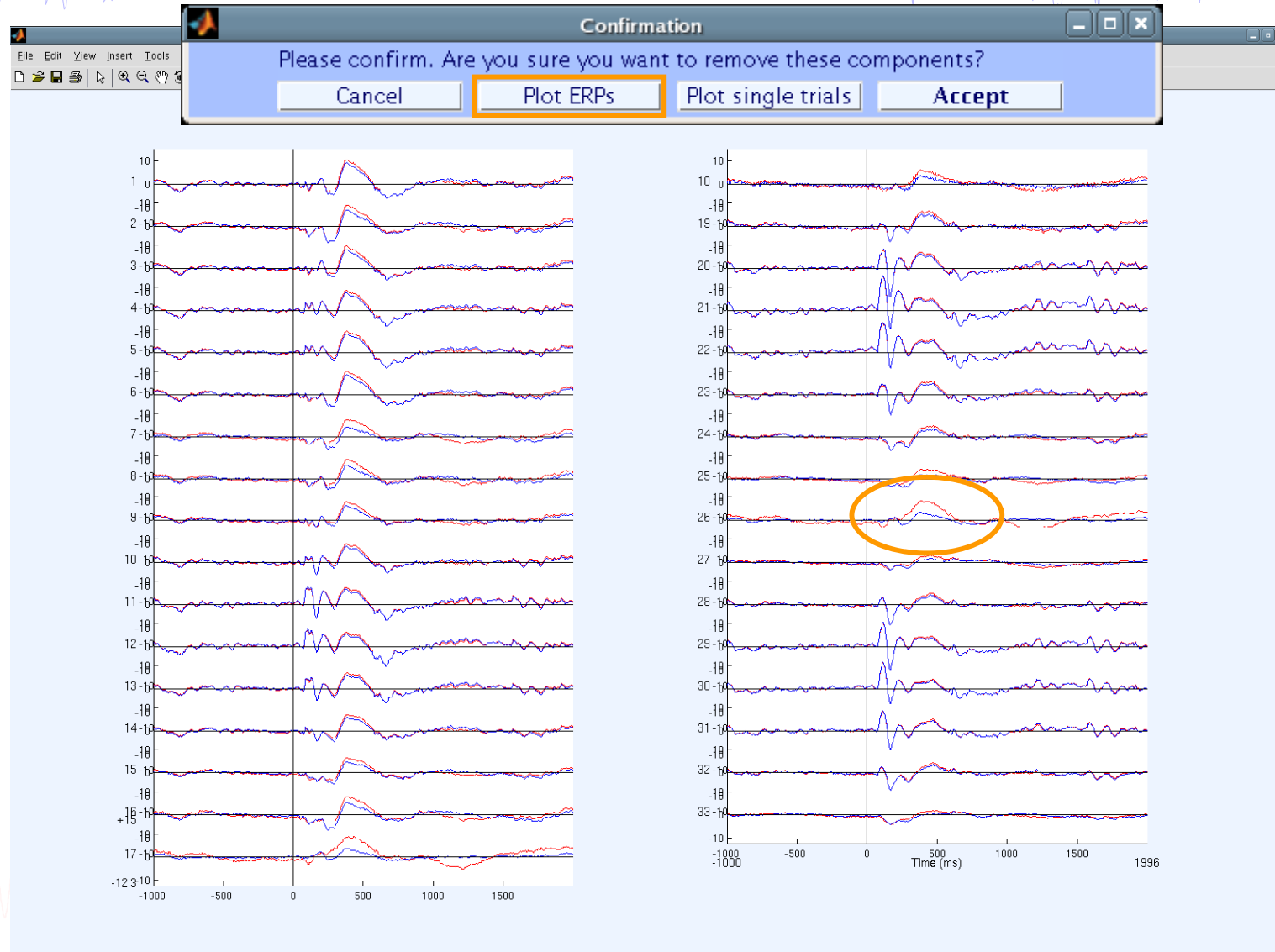
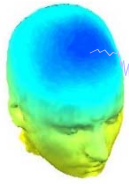
- 1) Evaluate IC Decomposition
- 2) IC Properties
- 3) Identify Artifacts
- 4) IC Selection
- 5) Intro to ICLabel Website



Indepent Component Rejection



Eye blink correction



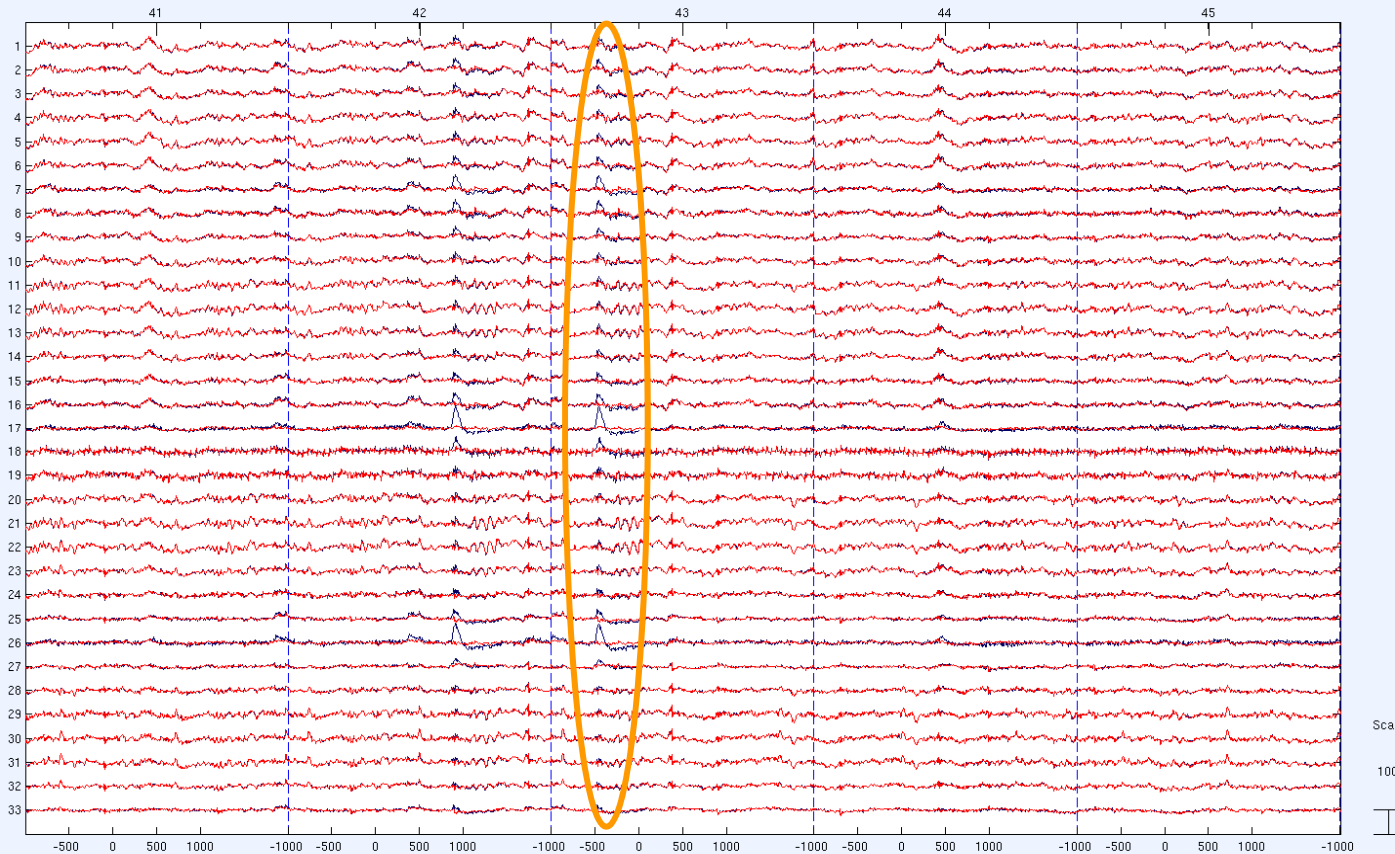
Eye blink correction



Confirmation

Please confirm. Are you sure you want to remove these components?

Cancel Plot ERPs Plot single trials Accept



CLOSE

<<

<

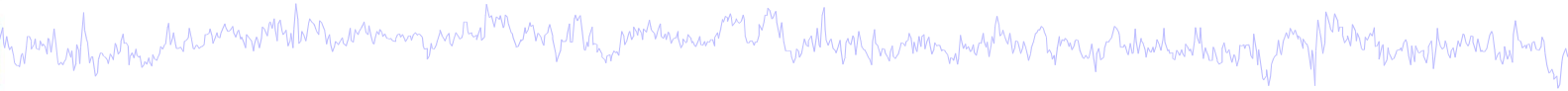
41

Confirmation

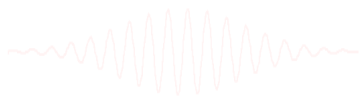
Please confirm. Are you sure you want to remove these components?

Cancel Plot ERPs Plot single trials Accept

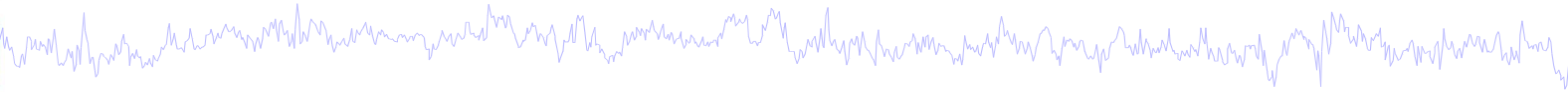
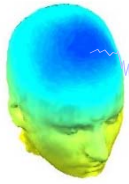
Evaluate ICA decomposition and artifacts



- 1) Evaluate IC Decomposition
- 2) IC Properties
- 3) Identify Artifacts
- 4) IC Selection
- 5) Intro to ICLabel Website



ICLabel website



ICLabel project: create automated EEG IC classifier (labeler)

Reaching.ucsd.edu:8000/tutorial
Purpose of the website:
Gather IC labels to accompany our
vast collection of datasets.

ICLabel Login

Login

[Need To Register?](#)

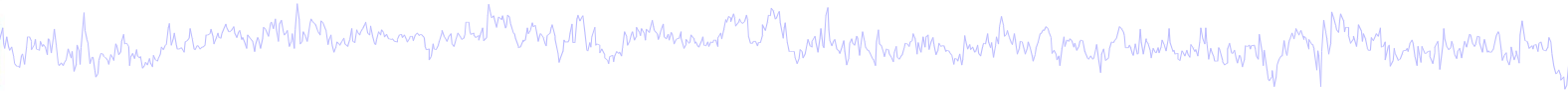
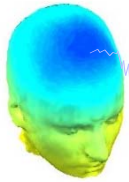
[Forgot Your Password?](#)

[What Is This Site?](#)

[Just want to practice?](#)

[Check Out The Leaderboard!](#)

ICLabel website - Profile



Features:

1. Label collection
2. Tutorial on IC classification
3. Labeling practice

Profile for [SCCN] Luca Pion-Tonachini

[Label EEG Components](#)

[Tutorial](#)

[Practice Labeling](#)

[Leave A Comment](#)

[Log Out](#)

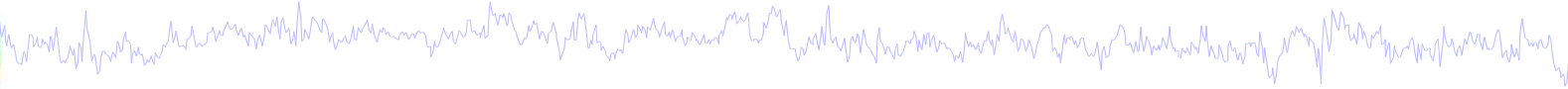
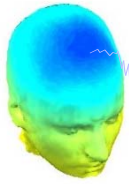
welcome to your profile. Below you can see some statistics of your activity. To the left, you can navigate to other parts of the website. If you are new to labeling EEG components, I highly recommend reading the tutorial and practicing on some components with feedback. If there is something you think is missing, let me know by leaving a comment (link to the left).

Number of labels submitted: 2782

Time of last submitted label: 2016-11-13 22:48:48

Member since: 2016-01-28 01:11:14

ICLabel website - Label



Newest IC

Back 1

Log Out

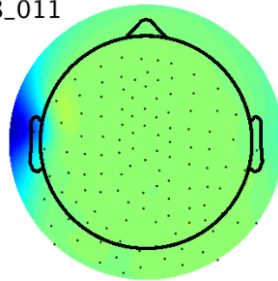
User: [SCCN] Luca Pion-Tonachini
Labels: 2782

Leaderboard

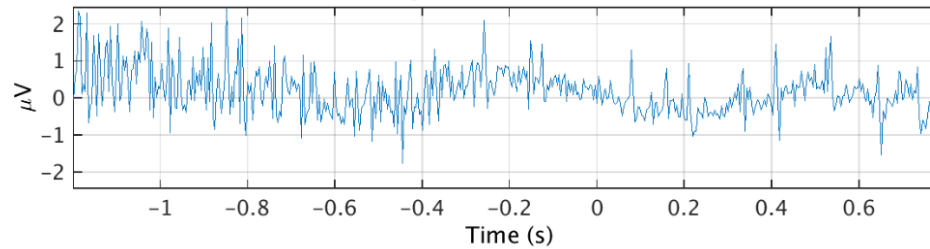
Tutorial

Profile

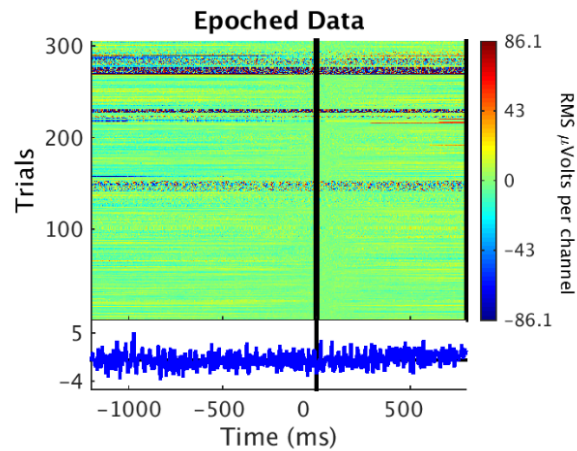
072188_011



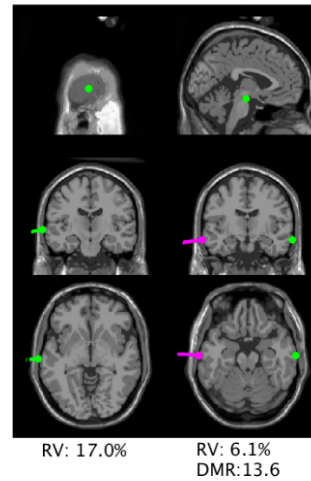
Component Time Series



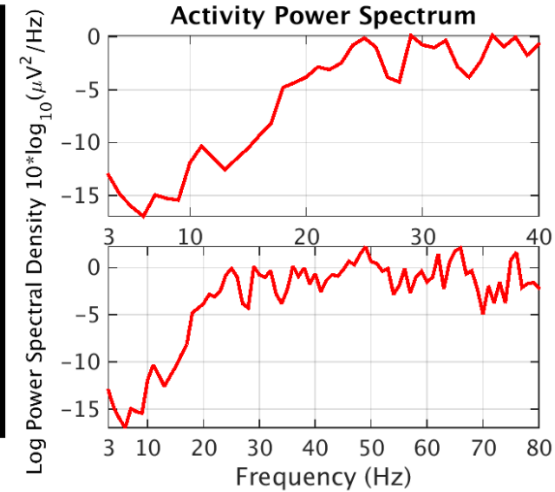
IC 11 of 30
Data Var. Accounted For:
15.96%



1 dipole 2 dipole



Activity Power Spectrum



Brain

Muscle

Eye

Heart

Next

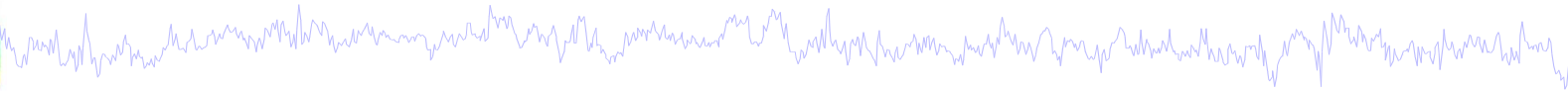
Line Noise

Chan Noise

Other

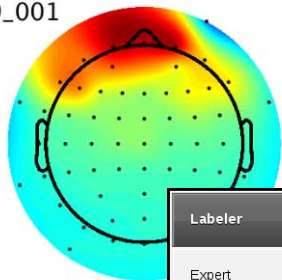
?

ICLabel website – Label feedback

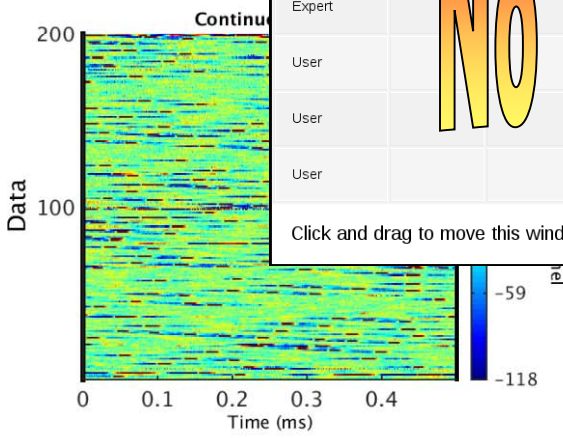


Leaderboard Tutorial Profile

012599_001



Component Time Series

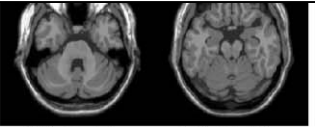
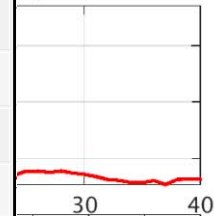


Labeler	Brain	Muscle	Eye	Heart	Line Noise	Chan Noise	Other	?
Expert			✓					
Expert			✓					
Expert			✓					
User								
User								
User			✓					

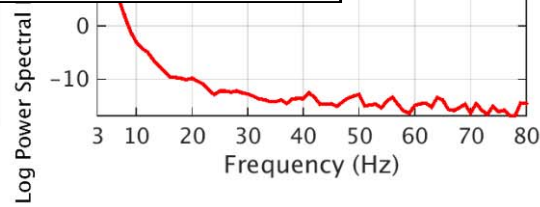
Click and drag to move this window. Next Comment

No Login Required

Spectrum

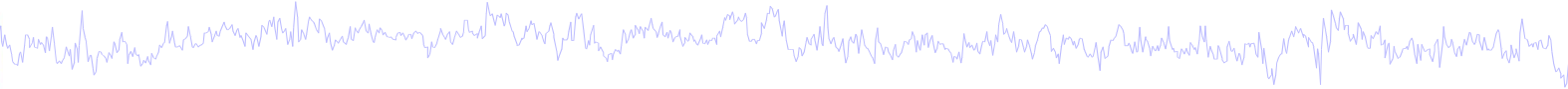


RV: 21.1% RV: 10.5%
DMR: 1.5



Brain Muscle Eye Heart Submit Line Noise Chan Noise Other ?

ICLabel website - Tutorial



Tutorial: EEG Independent Component Labeling

[Overview](#)

[Why Help Us?](#)

[How To Label](#)

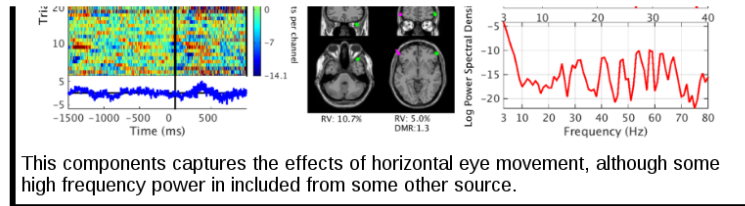
[Telling Components Apart](#)

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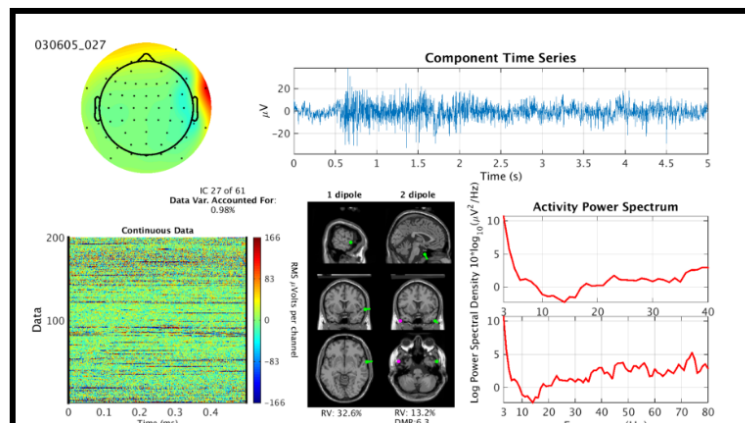


Muscle Component

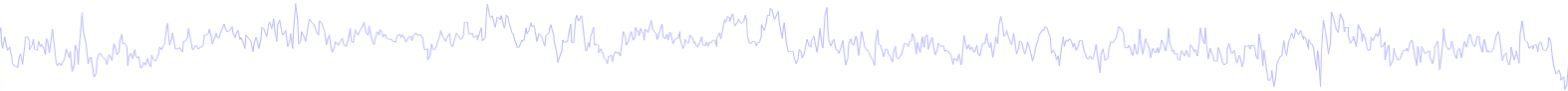
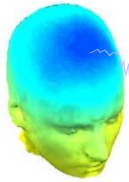
Muscle components describe the electrical fields generated by muscle activity, known as [electromyography](#) (EMG). Their activations are powerful relative to EEG but motor unit action potentials (the underlying source of EMG) do not synchronize causing most of the power of EMG to be spread out among higher frequencies. Nonetheless, these components can still look dipolar, although they will seem very shallow as they are not localized within the brain. You can tell a shallow dipole by how concentrated its scalp topography is. The more concentrated, the shallower. That isn't to say that all muscle components will be dipolar.

Summary

- Power concentrated in higher frequencies (20 Hz and above)
- Can still be dipolar, but will be located outside the skull



Exercises



Now and later:

- Practice on the ICLabel website:
reaching.ucsd.edu:8000/labelfeedback
- Extra Credit: Submit labels once you feel proficient

Alternatively:

- Load `stern_125Hz.set`
- Epoch the data on **memorize** (ie B, C,...) letters -1 to 2s
- Find and identify “brain” ICs
- Can you distinguish some of the non-brain ICs as well?

