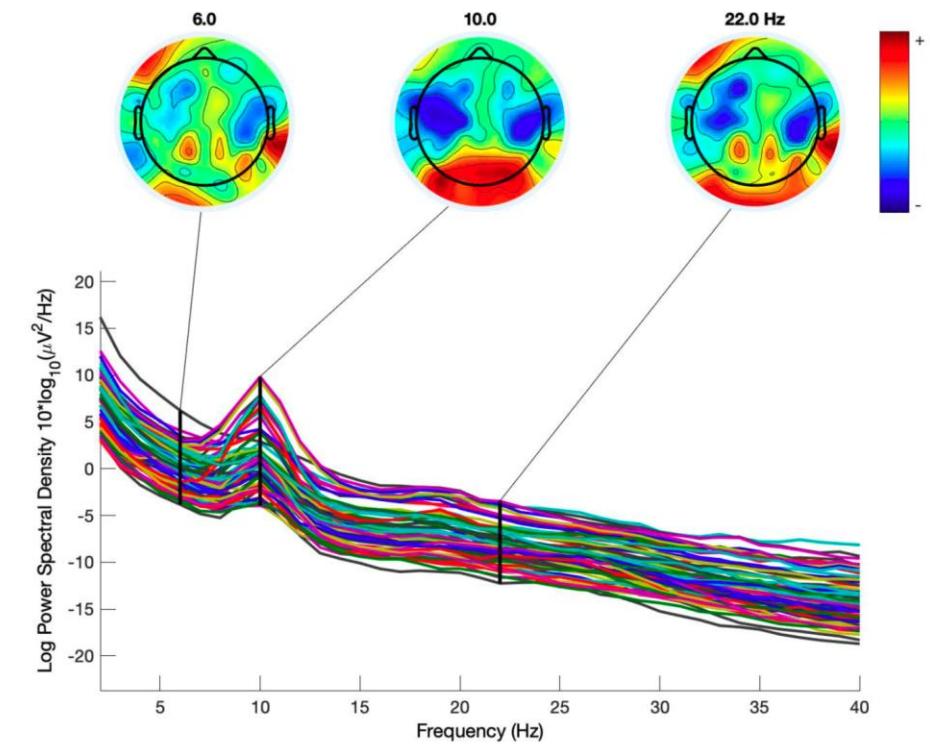
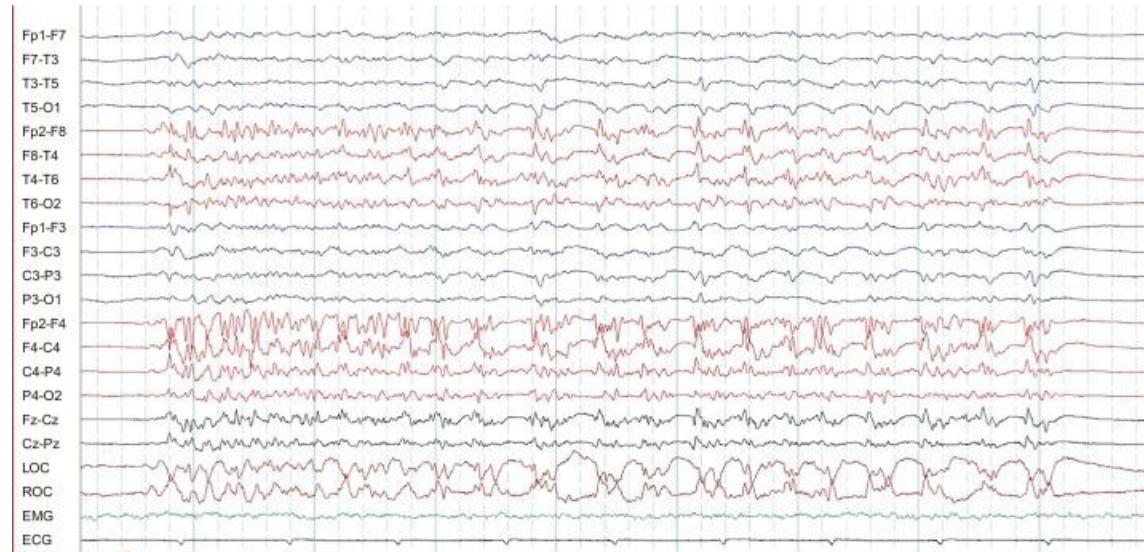


EEGLAB and ERPLAB

Interdisciplinary Schools
Signal Processing Department
Parisa Khoorahe

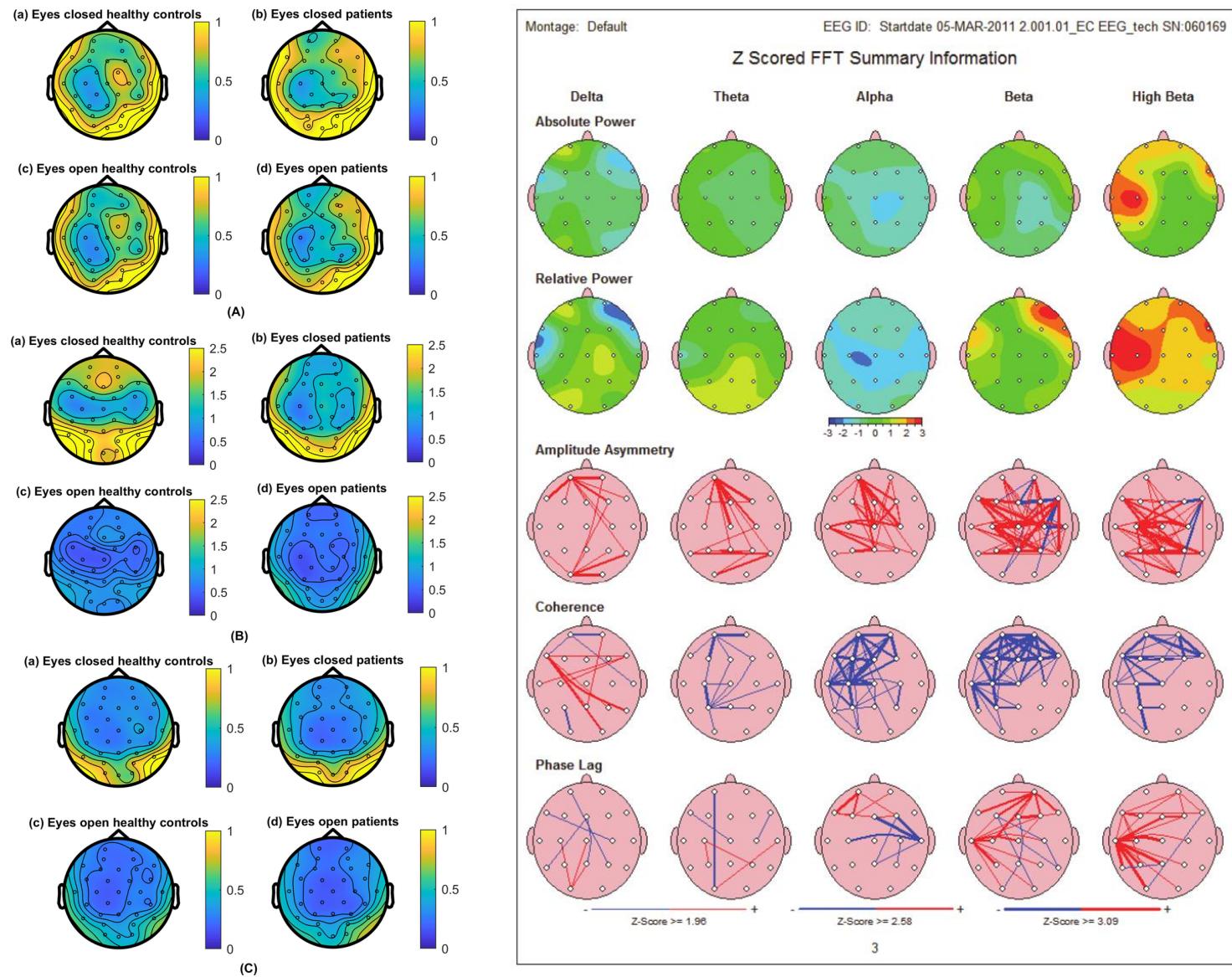
ERP

Rest-state EEG

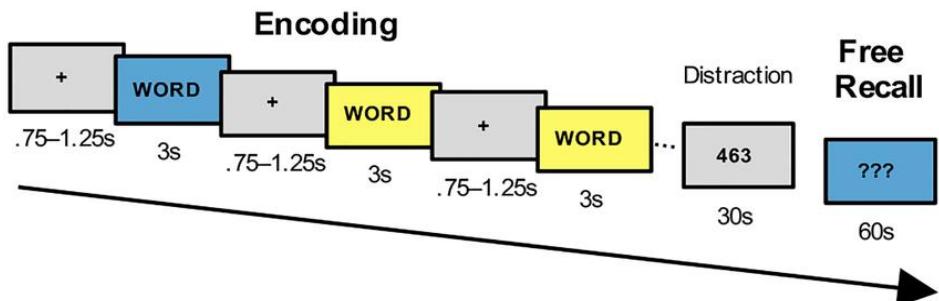


ERP

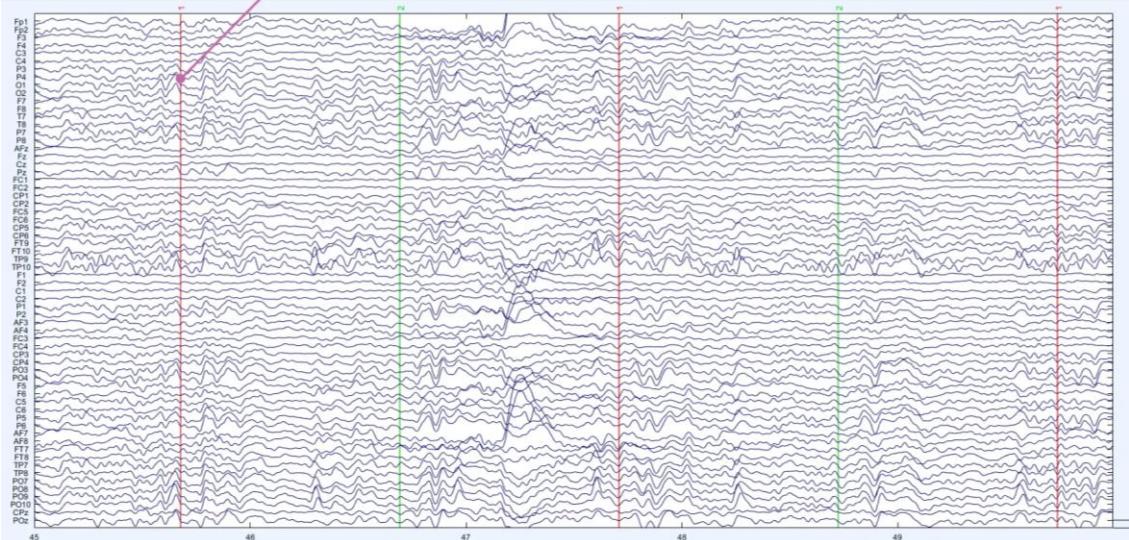
- Frequency analysis
- Spectral power
- Clinical biomarkers
- Functional connectivity



ERP



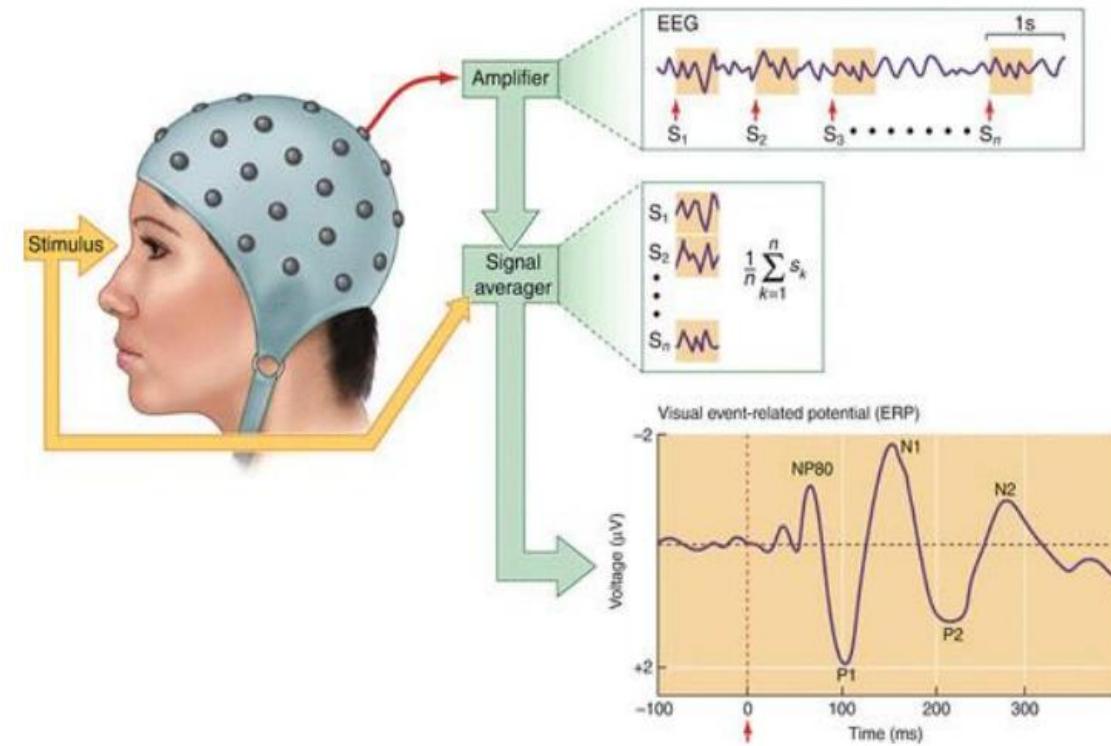
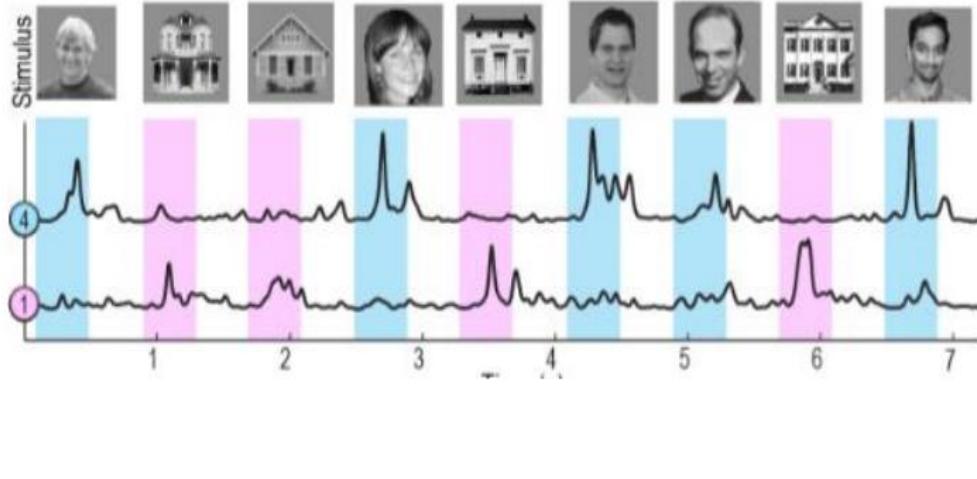
Trigger



- Task
- Trial
- Block
- Event
- Epoch (Segment)
- Trigger (Event marker, Event code)

ERP

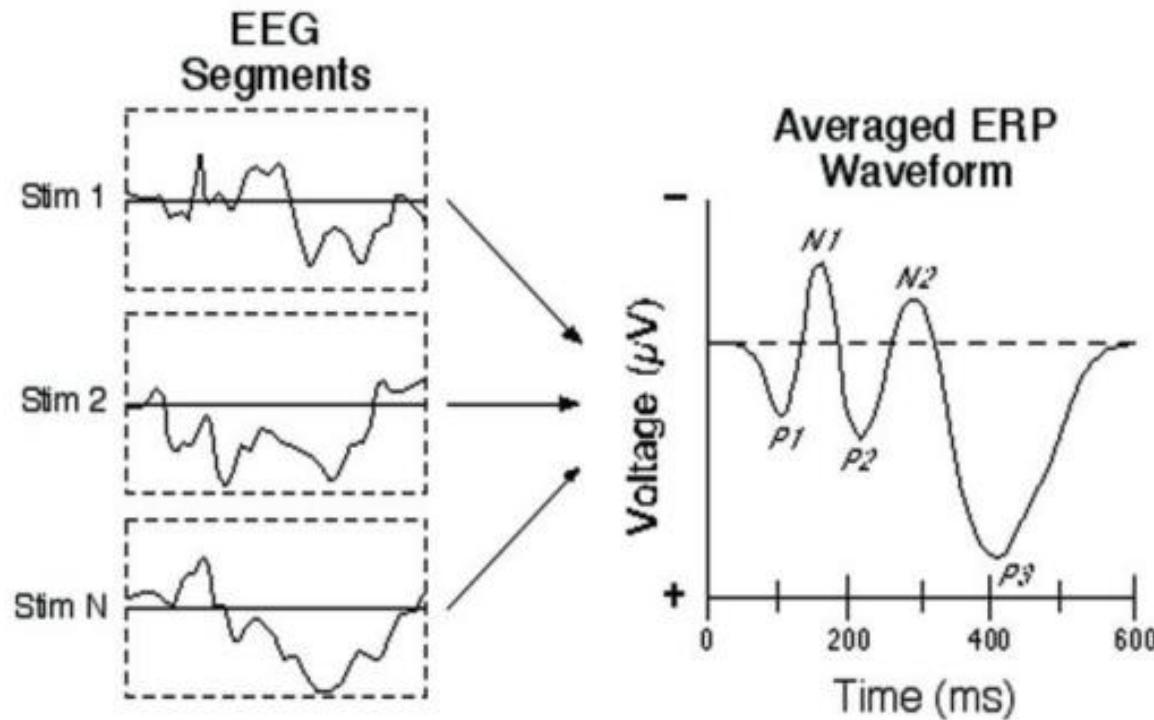
Faces/Houses



ERP

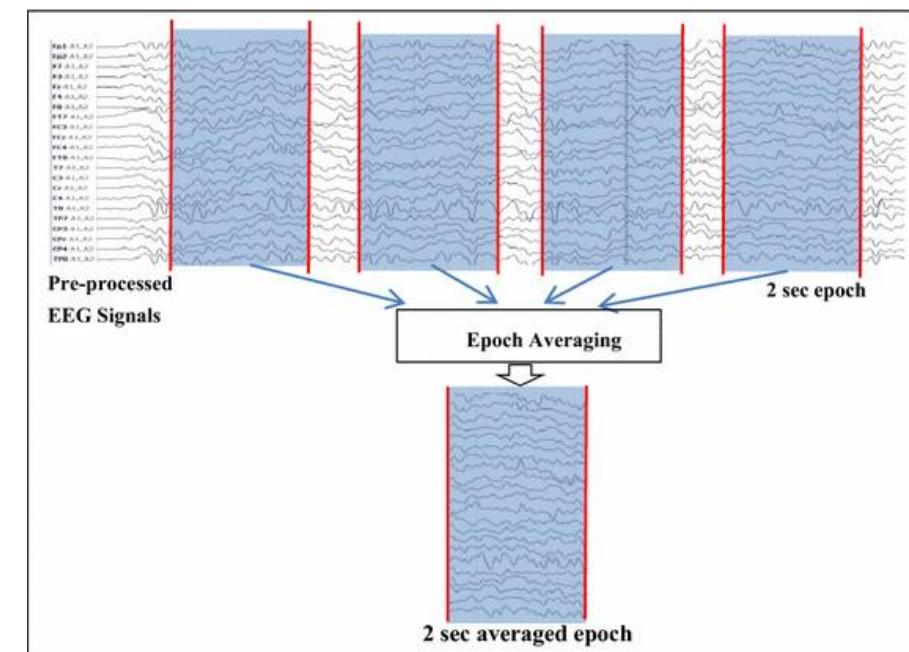
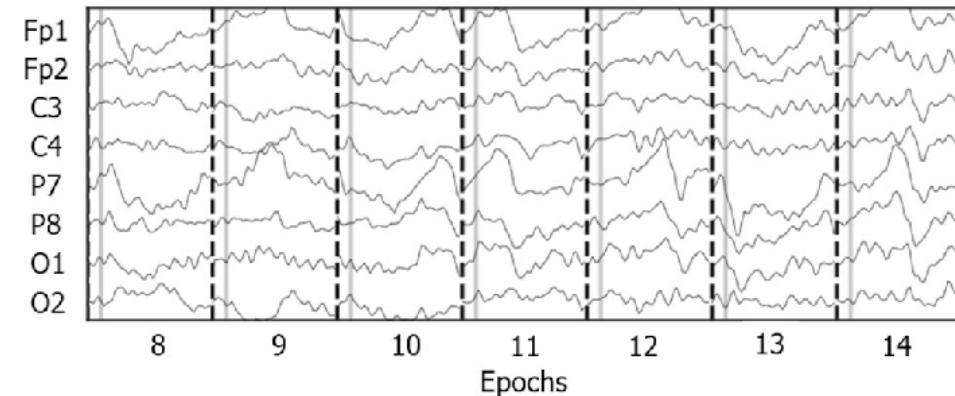
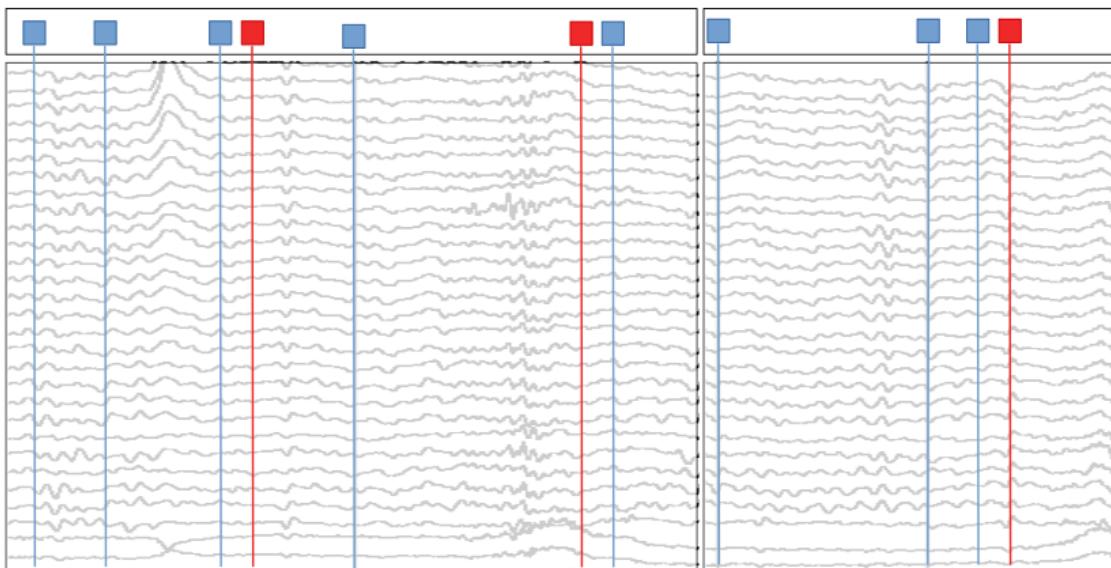
Event-related potentials:

Isolate neural responses linked to particular cognitive processes



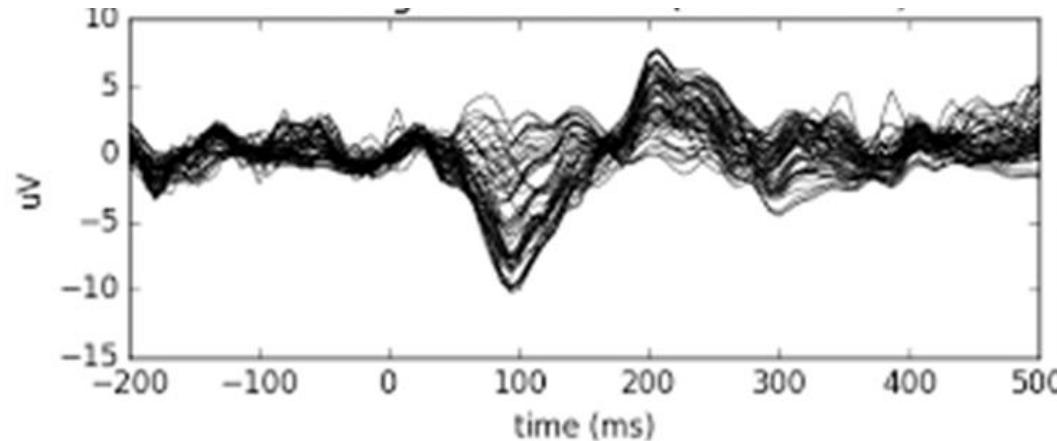
ERP

Task-based EEG

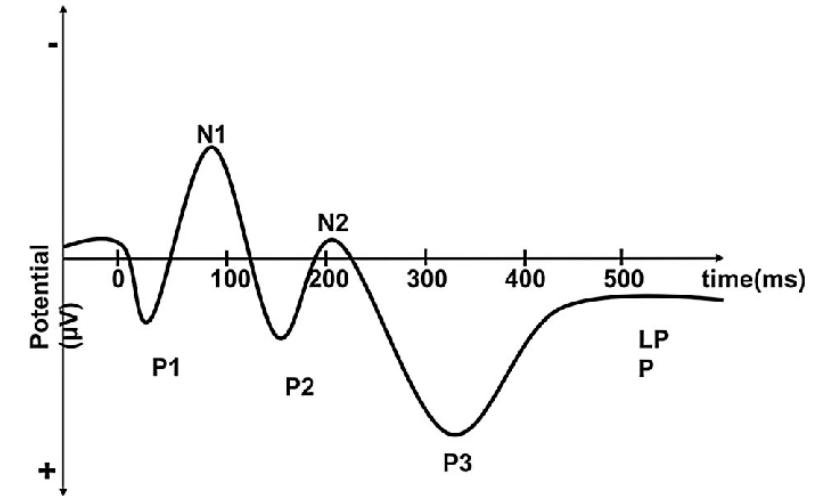


ERP

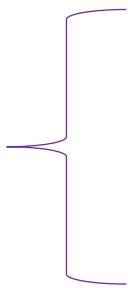
ERPs



Averaged ERP waveforms



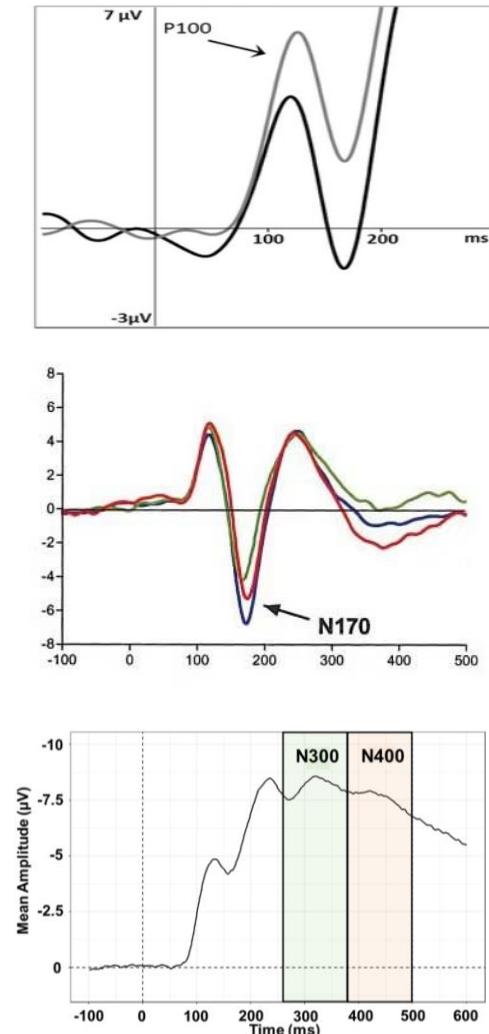
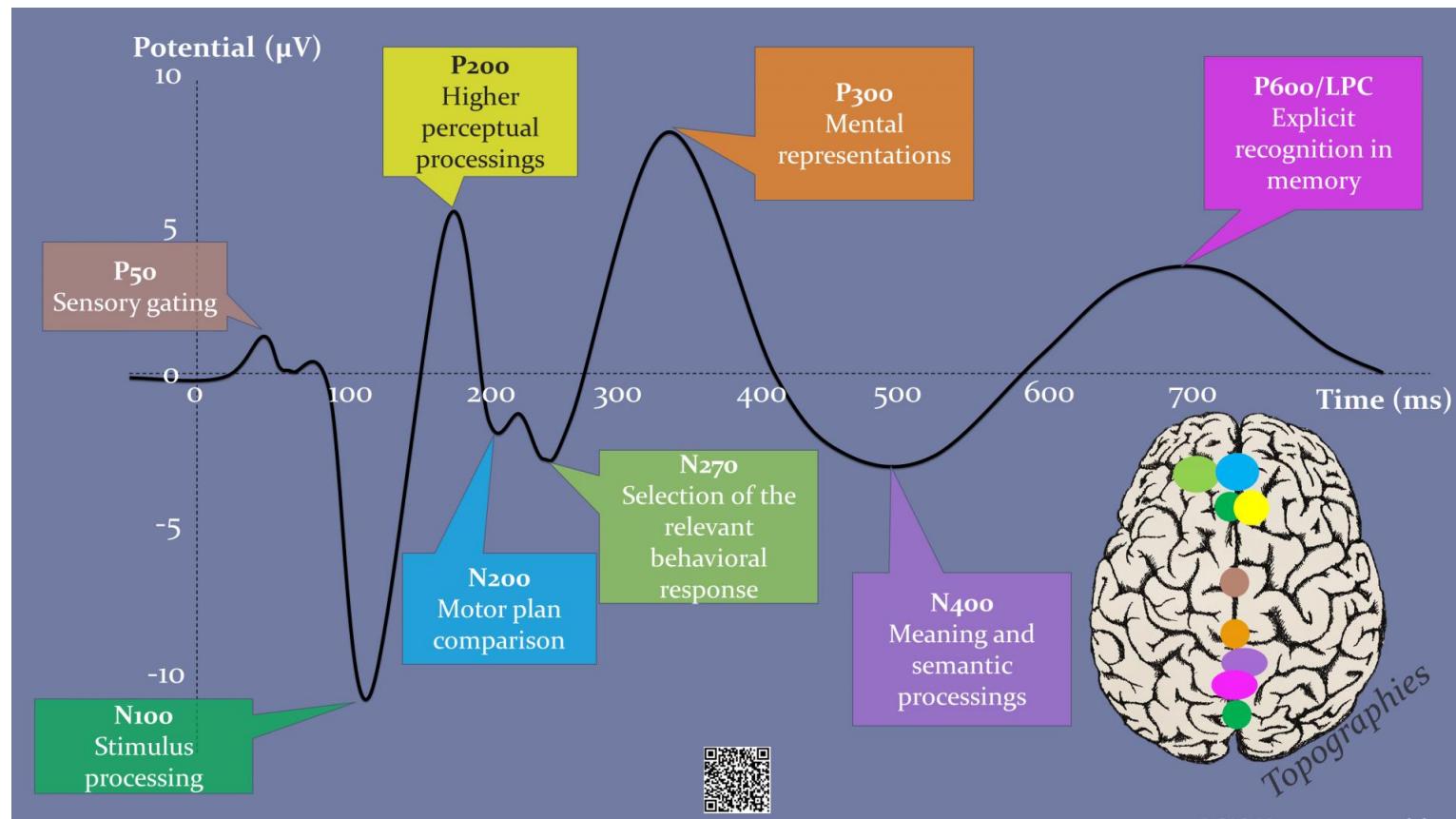
Components:



- Polarity
- Latency
- Location

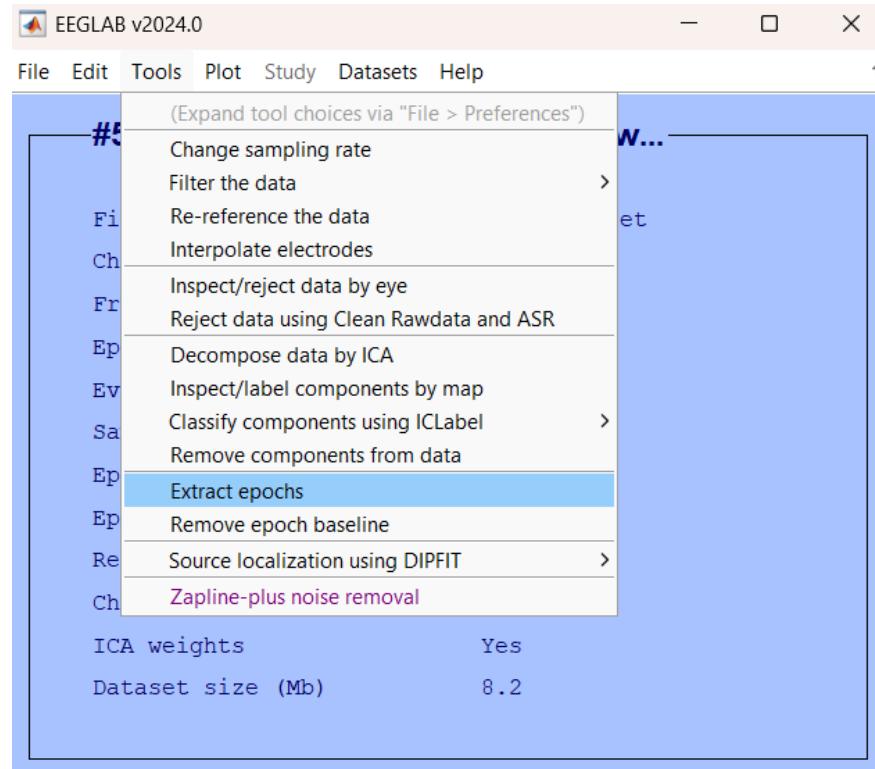
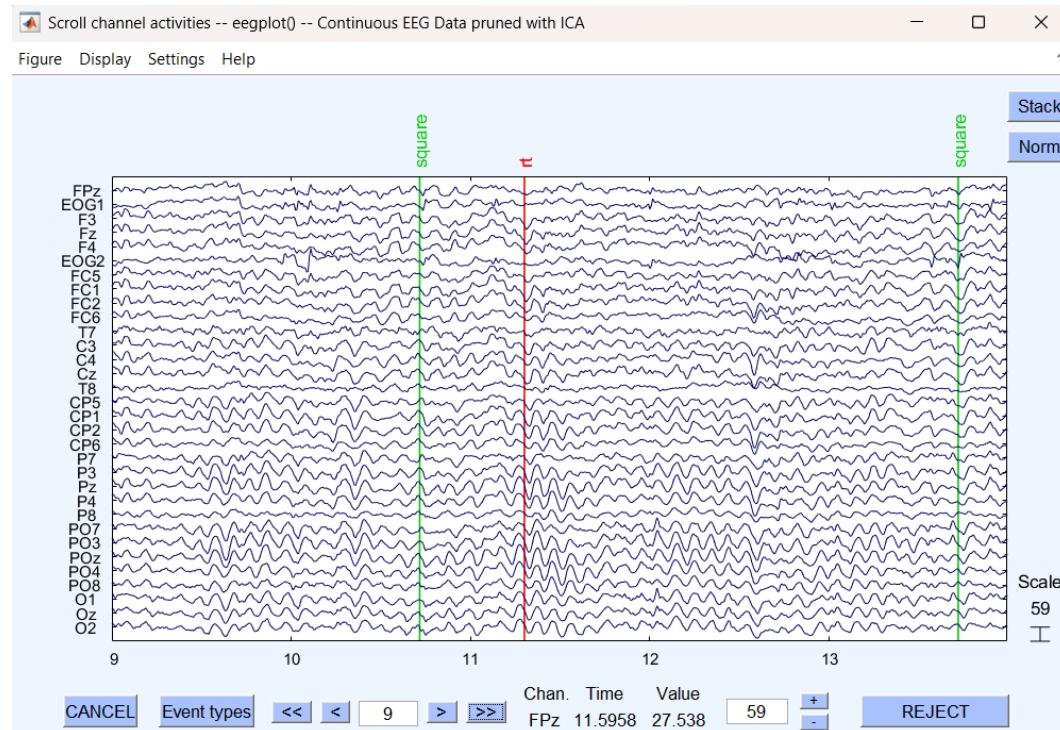
ERP

ERP Components



ERP

Extract epochs



Extract data epochs - pop_epoch0

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

Epoch limits [start, end] in seconds -0.5 1

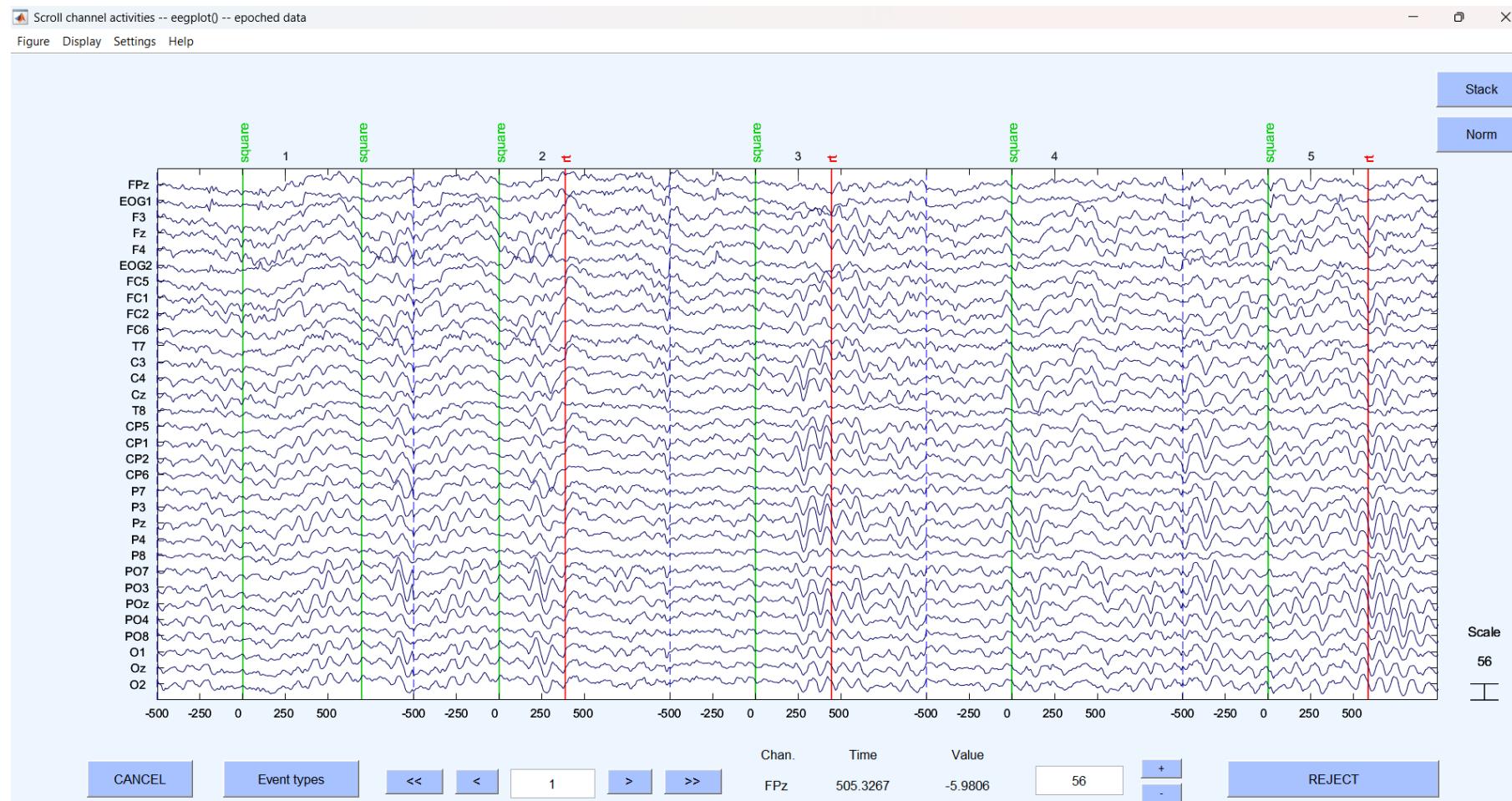
Name for the new dataset epoched data

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

Help Cancel Ok

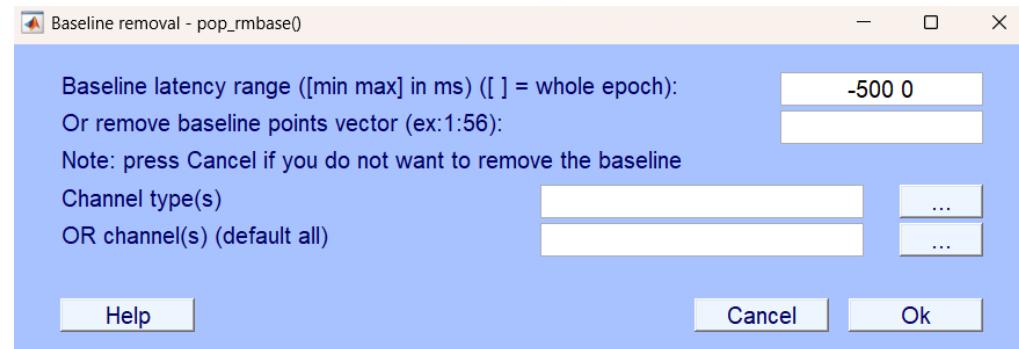
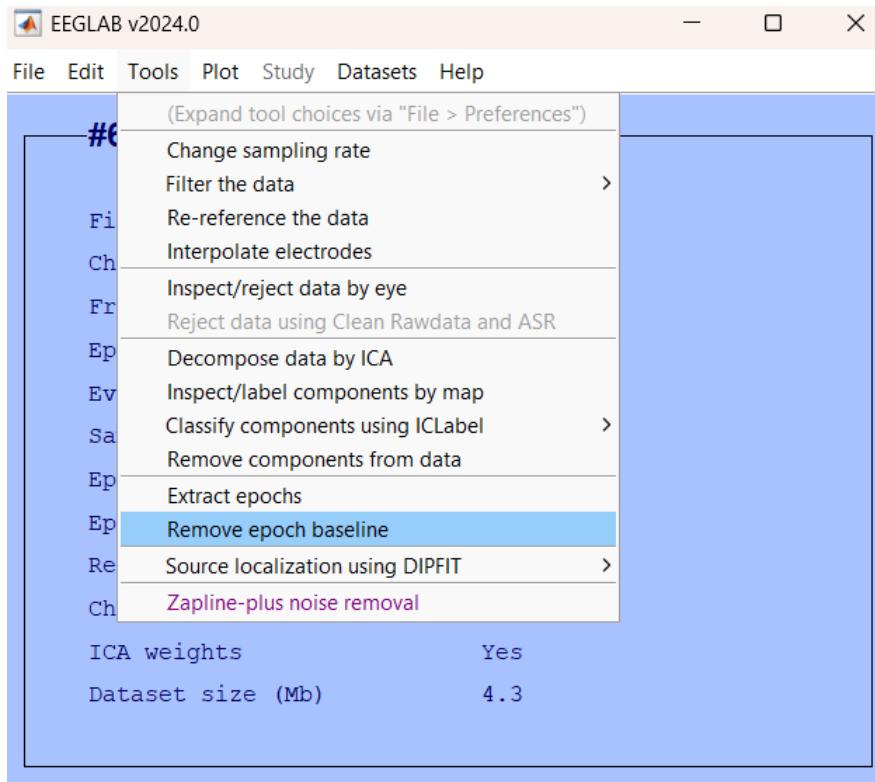
ERP

Extract epochs

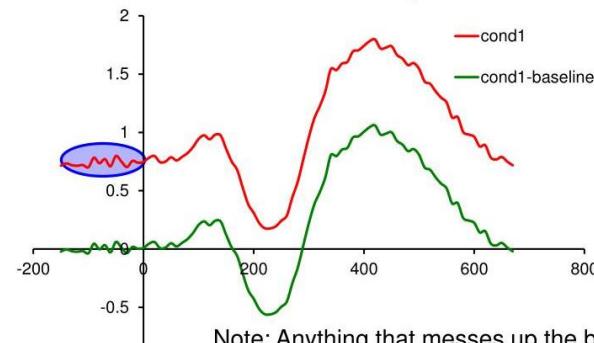


ERP

Remove epoch baseline



Goal: Subtract estimate of DC offset from the waveform
Mean prestimulus voltage is usually a reasonable estimate
Subtract this value from each point in the waveform



Note: Anything that messes up the baseline (e.g., noise, overlap) will be propagated to your amplitude measurements

ERP

Channel ERP image

The image shows two windows from the EEGLAB software. The main window is titled "EEGLAB v2024.0" and displays a hierarchical menu structure. The "Plot" menu is open, and the "Channel ERP image" option is selected, highlighted with a blue background. The status bar at the bottom indicates "ICA weights Yes" and "Dataset size (Mb) 4.3".

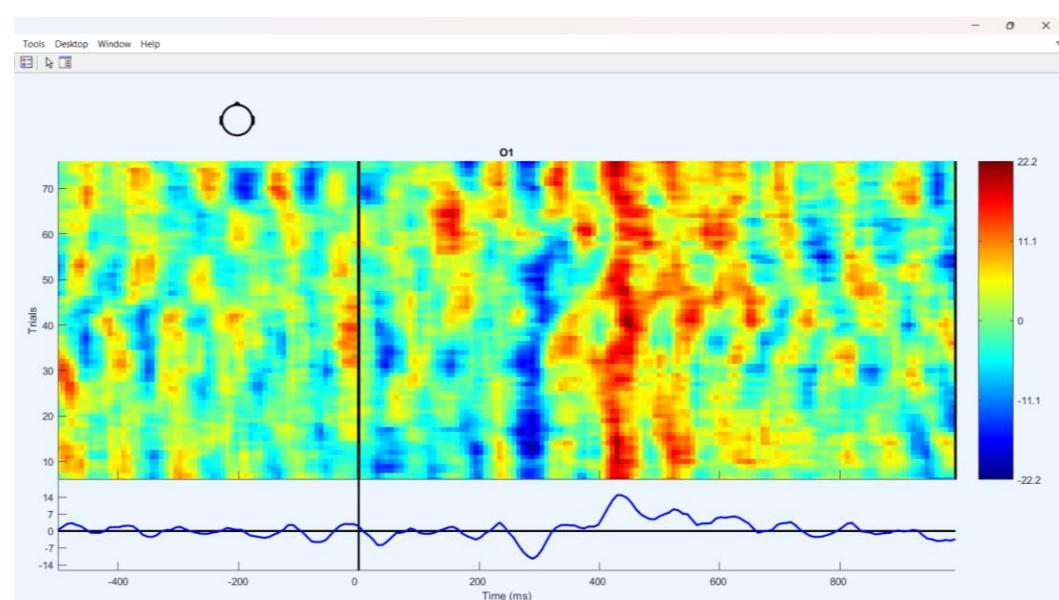
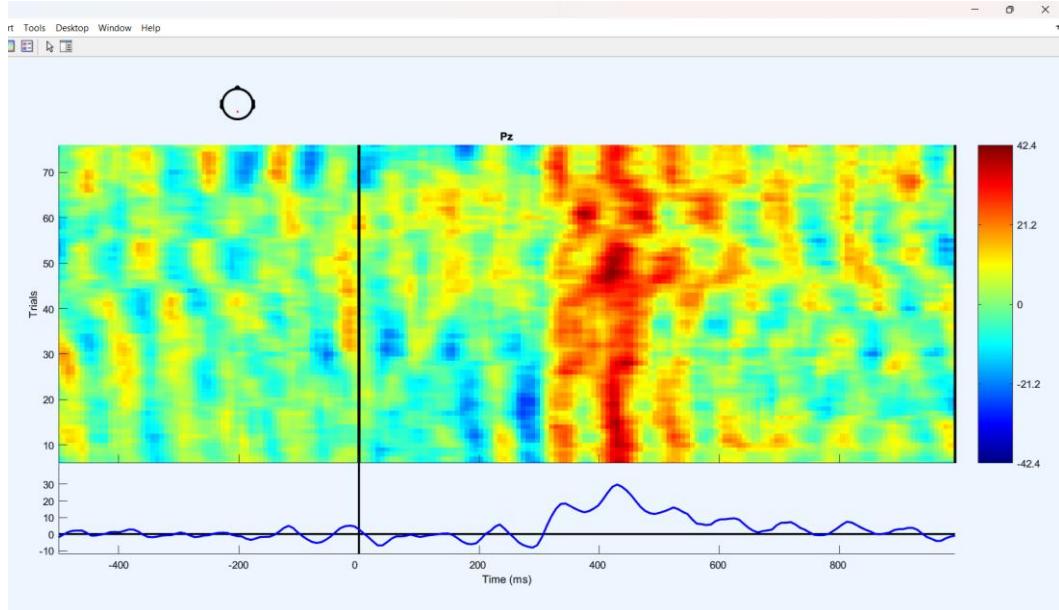
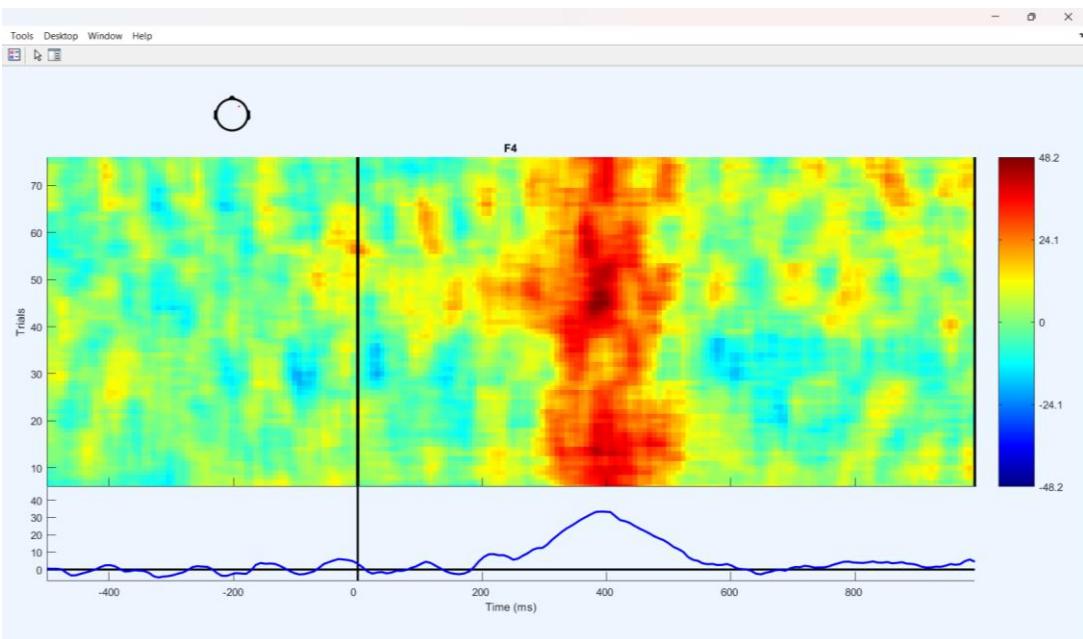
The second window is titled "Channel ERP image -- pop_erpimage0". This is a configuration dialog with the following settings:

- Channel:** 1
- Smoothing:** 10
- Downsampling:** 1
- Time limits (ms):** -500 992.1875
- Fig. title:** [Empty text field]
- Checkboxes:** Plot scalp map, Plot ERP, Plot colorbar
- Buttons:** ERP limits (uV), Color limits (see Help)
- Sort/align trials by epoch event values:** Epoch-sorting field, Event type(s), Event time range, Rescale (set to no), Align, Don't sort by value, Don't plot values
- Sort trials by phase:** Frequency (Hz | minHz maxHz), Percent low-amp. trials to ignore, Window center (ms), Wavelet cycles (set to 3)
- Inter-trial coherence options:** Frequency (Hz | minHz maxHz), Signif. level (<0.20), Amplitude limits (dB), Coher limits (<=1), Image amps (Requires signif.)
- Other options:** Plot spectrum (minHz maxHz), Baseline ampl. (dB), Mark times (ms), More options (see >> help erpimage)

At the bottom of the dialog are "Help", "Cancel", and "Ok" buttons.

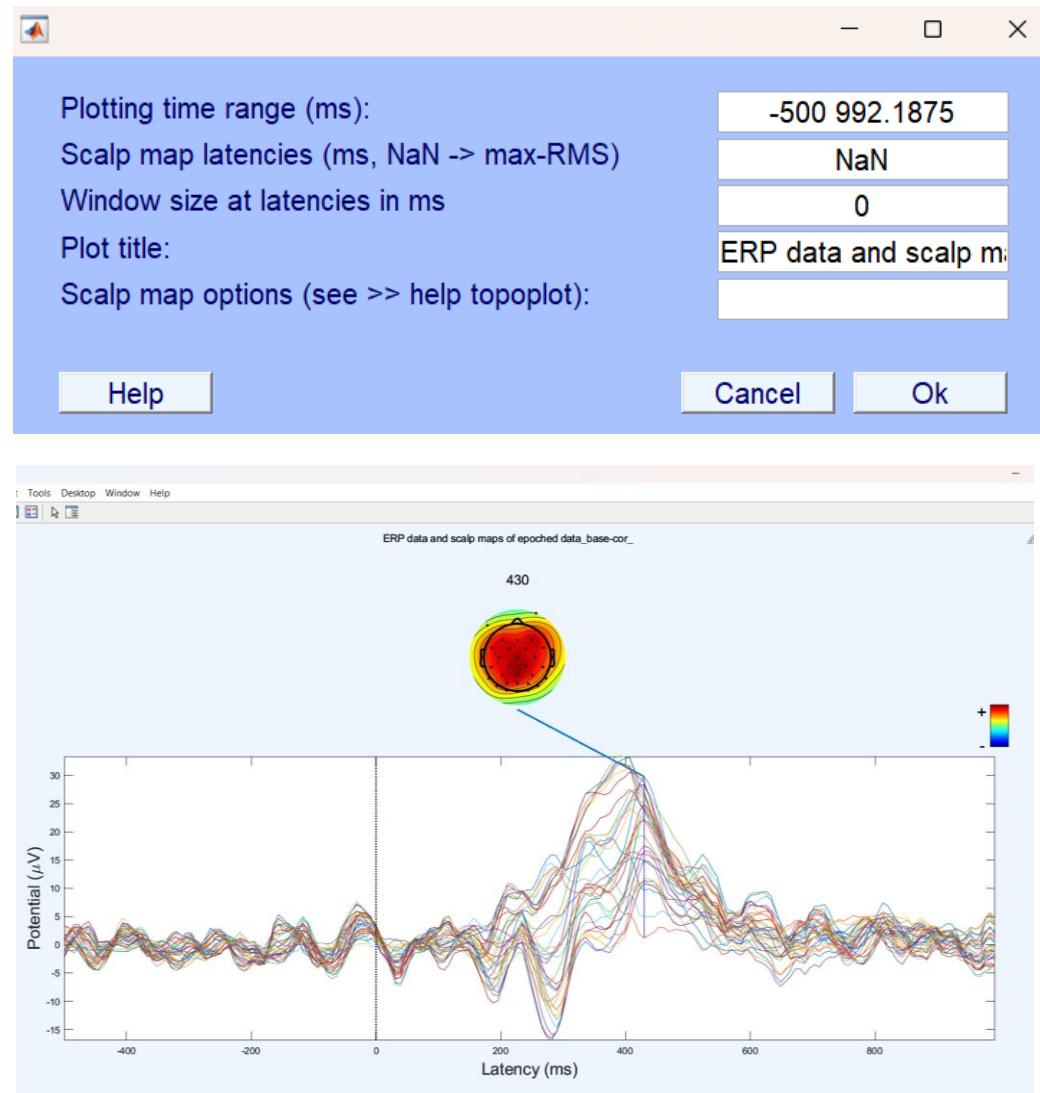
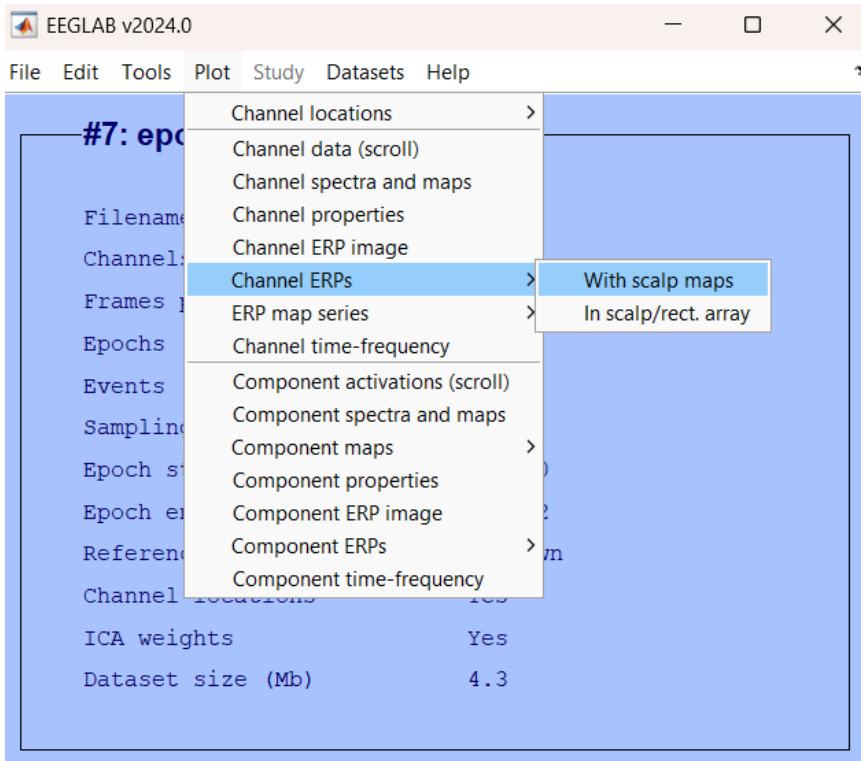
ERP

Channel ERP image



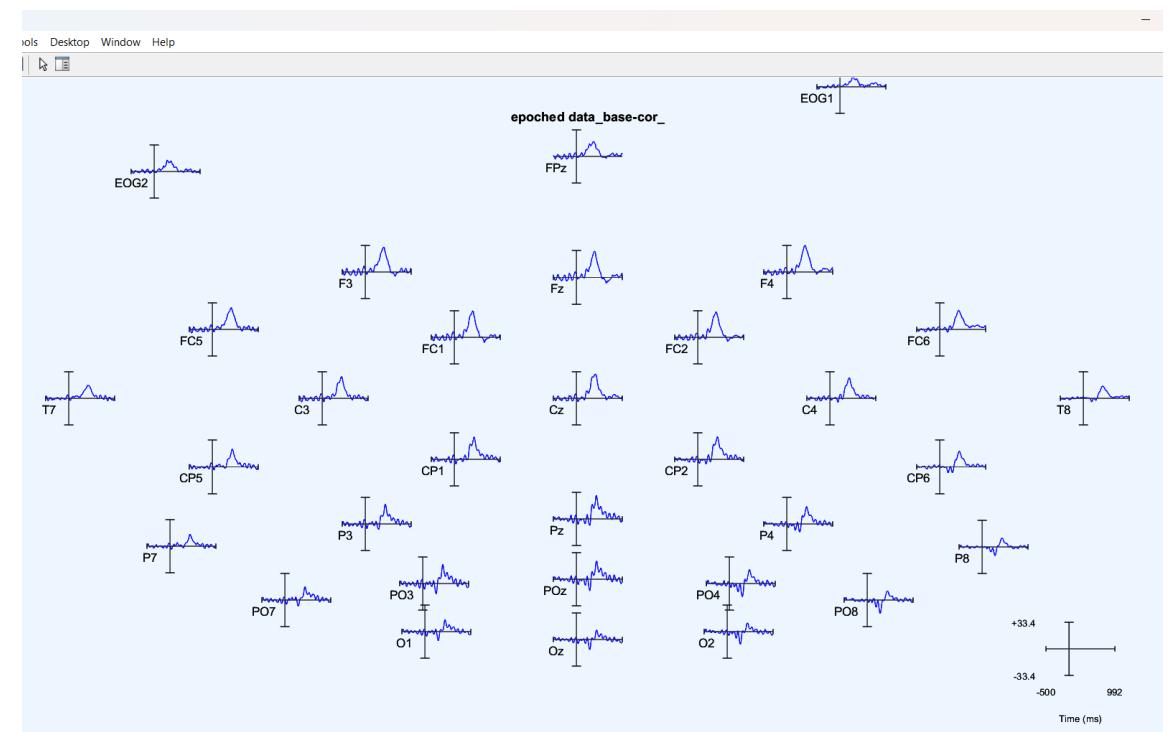
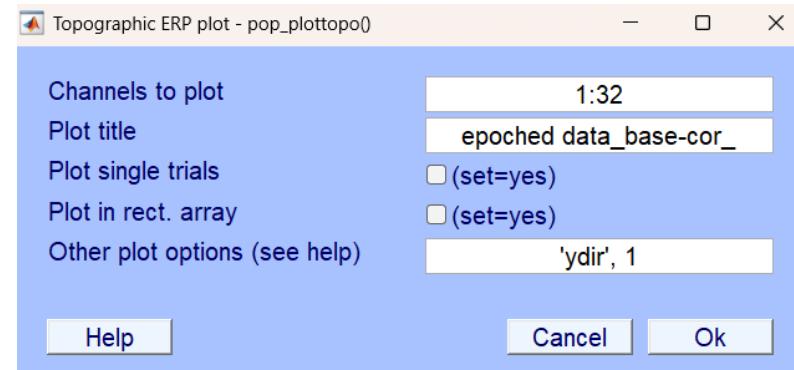
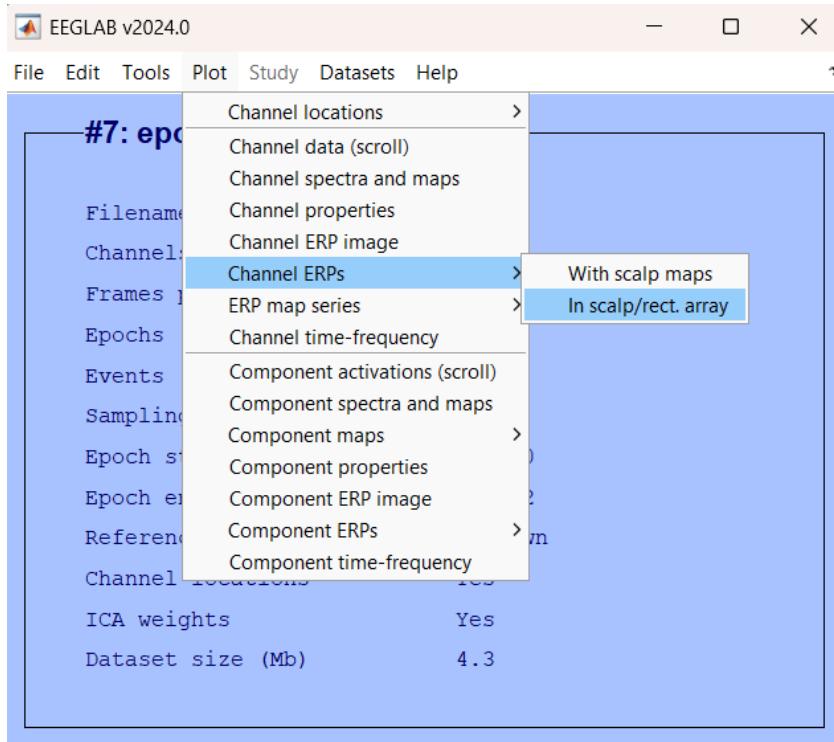
ERP

Channel ERPs



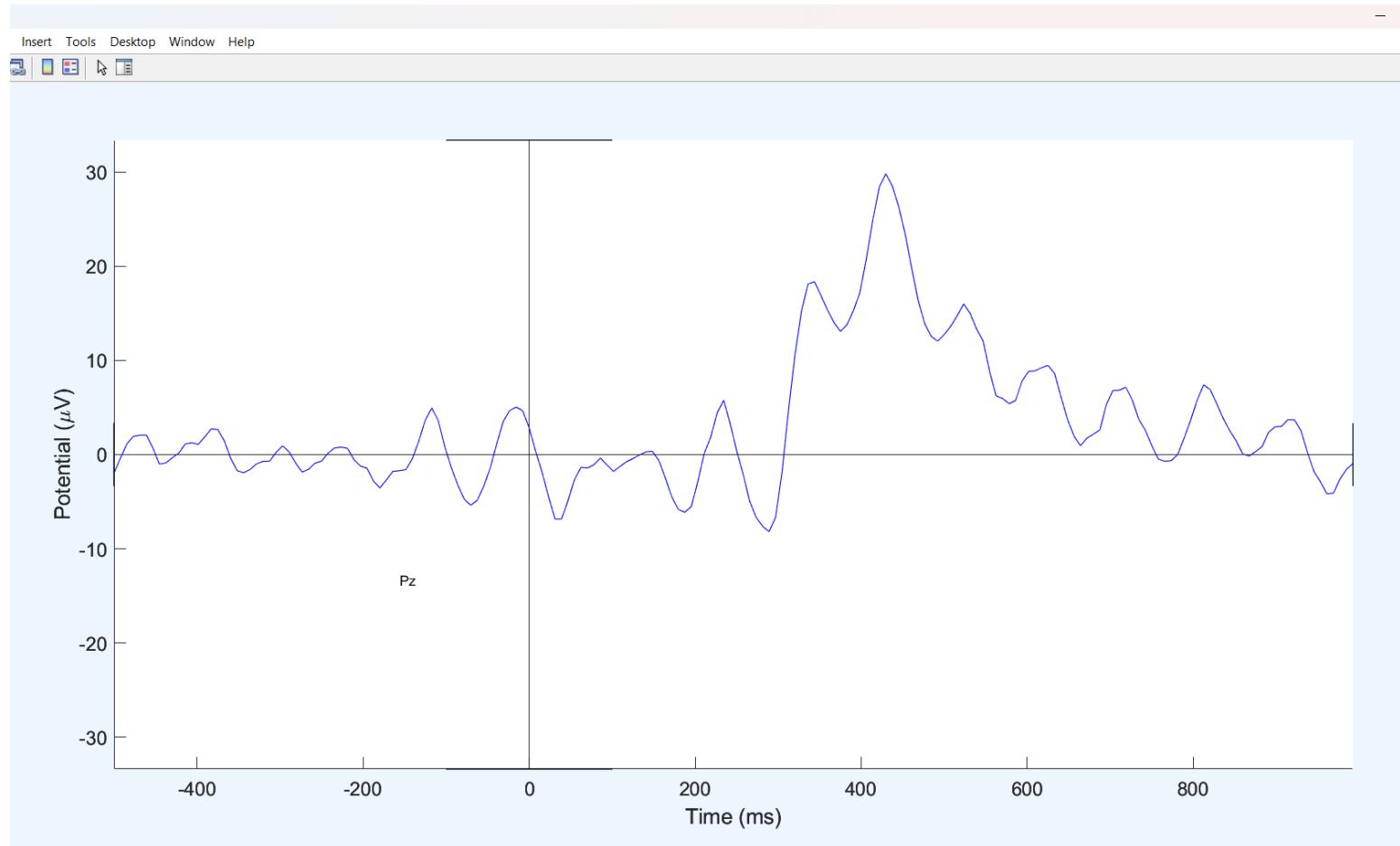
ERP

Channel ERPs



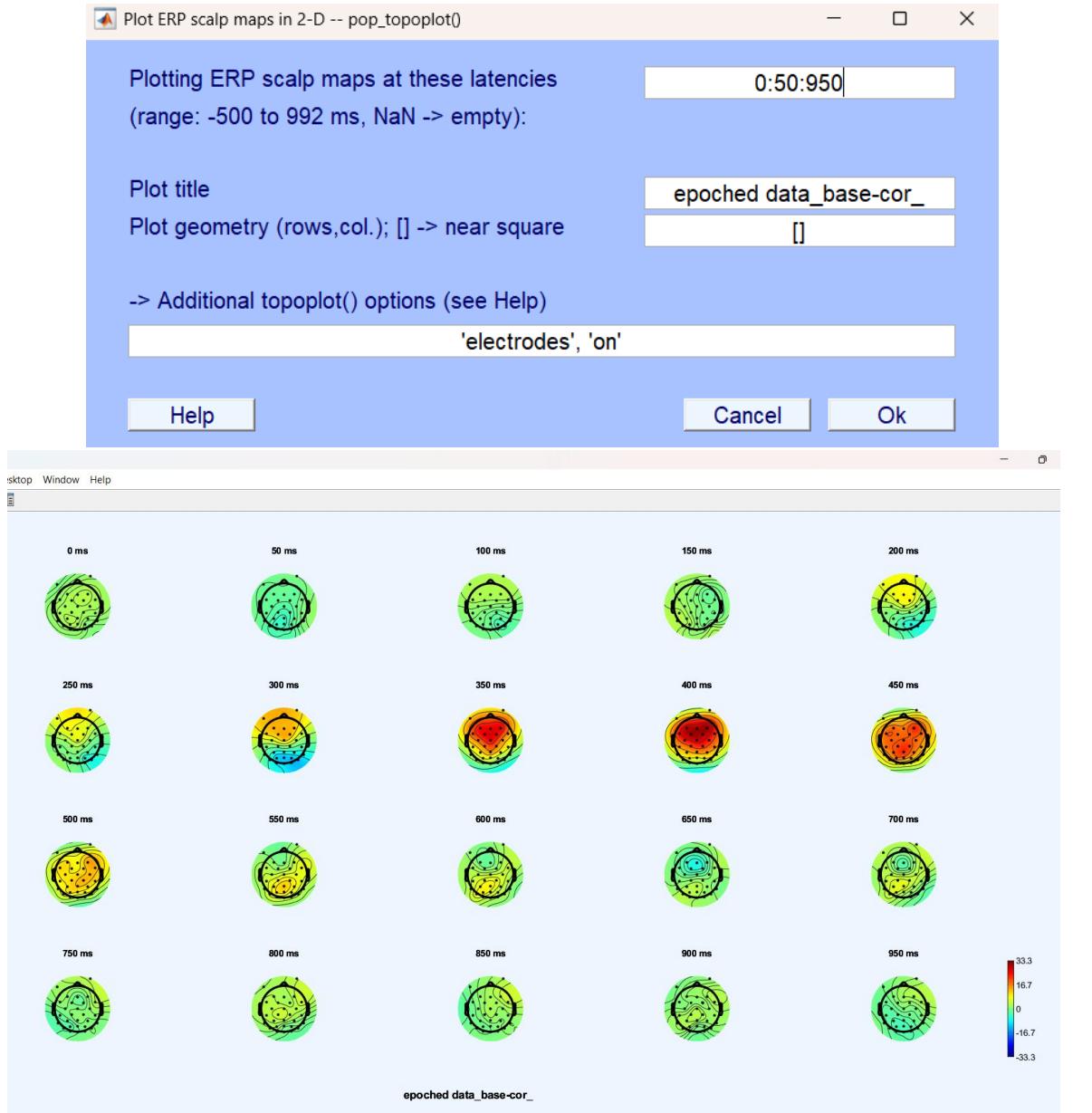
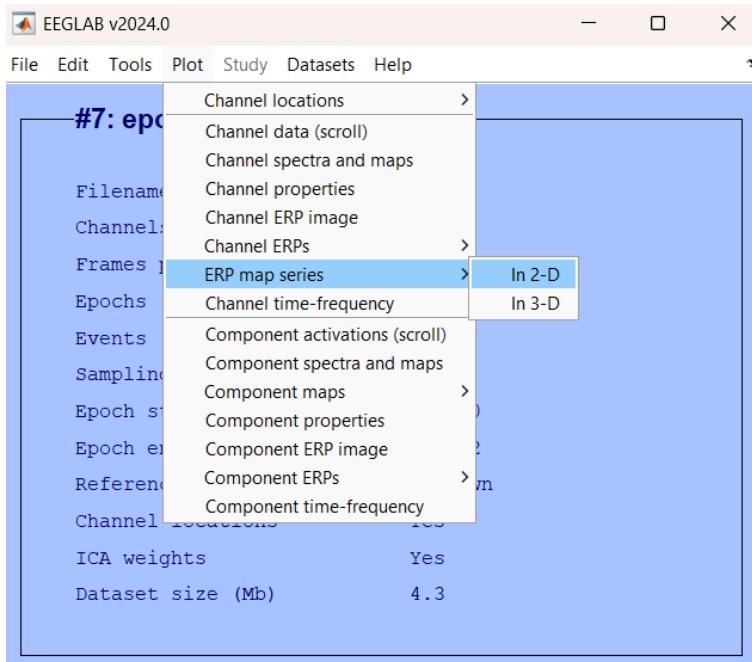
ERP

Channel ERPs



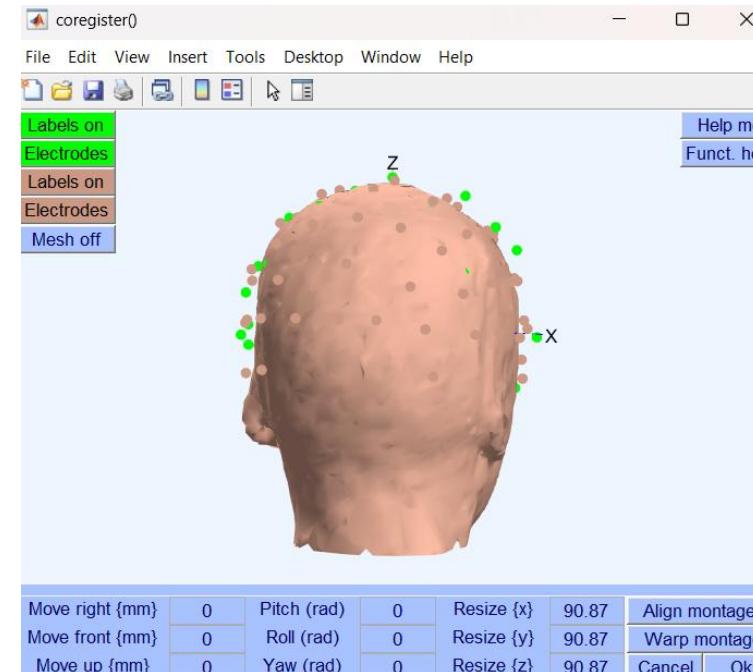
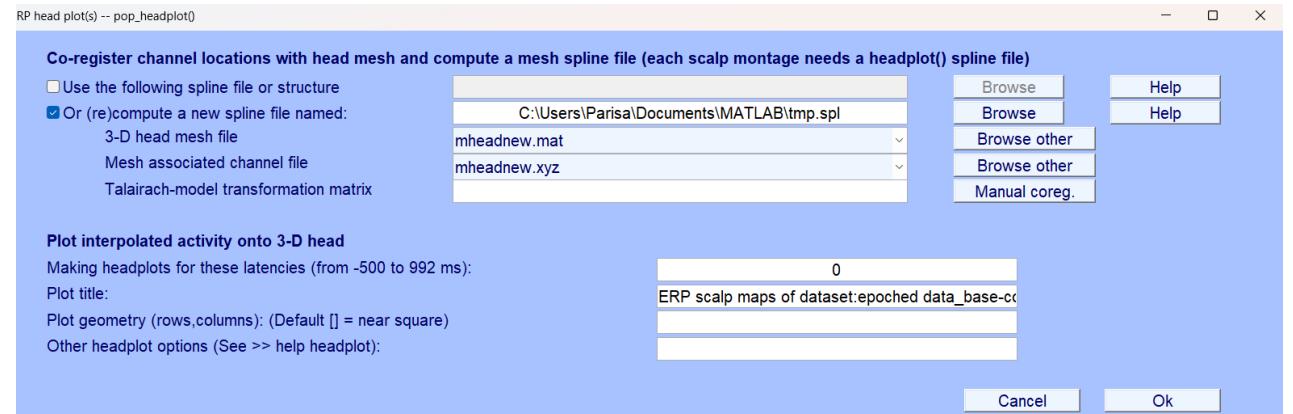
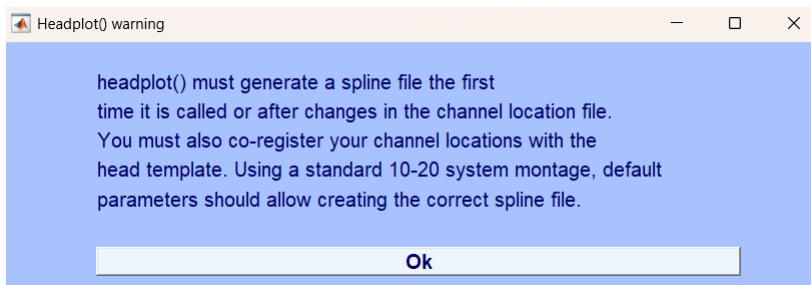
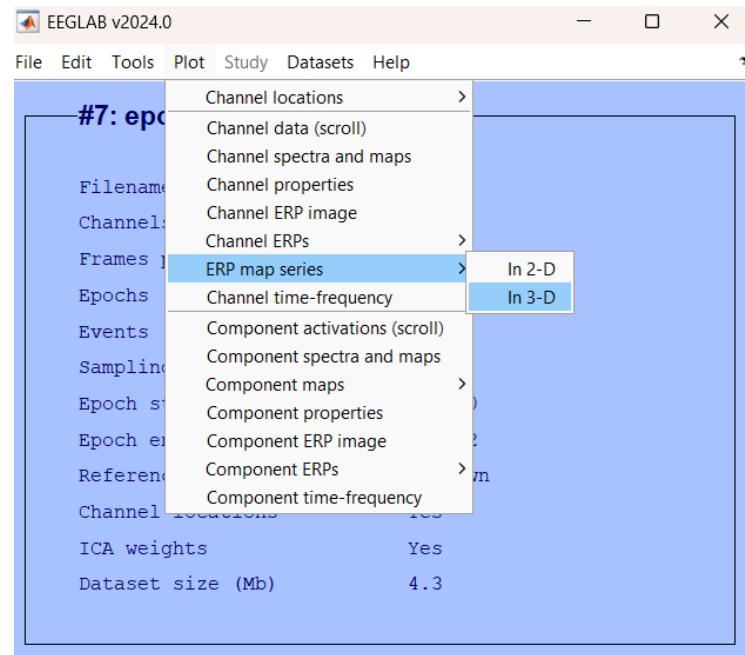
ERP

ERP series



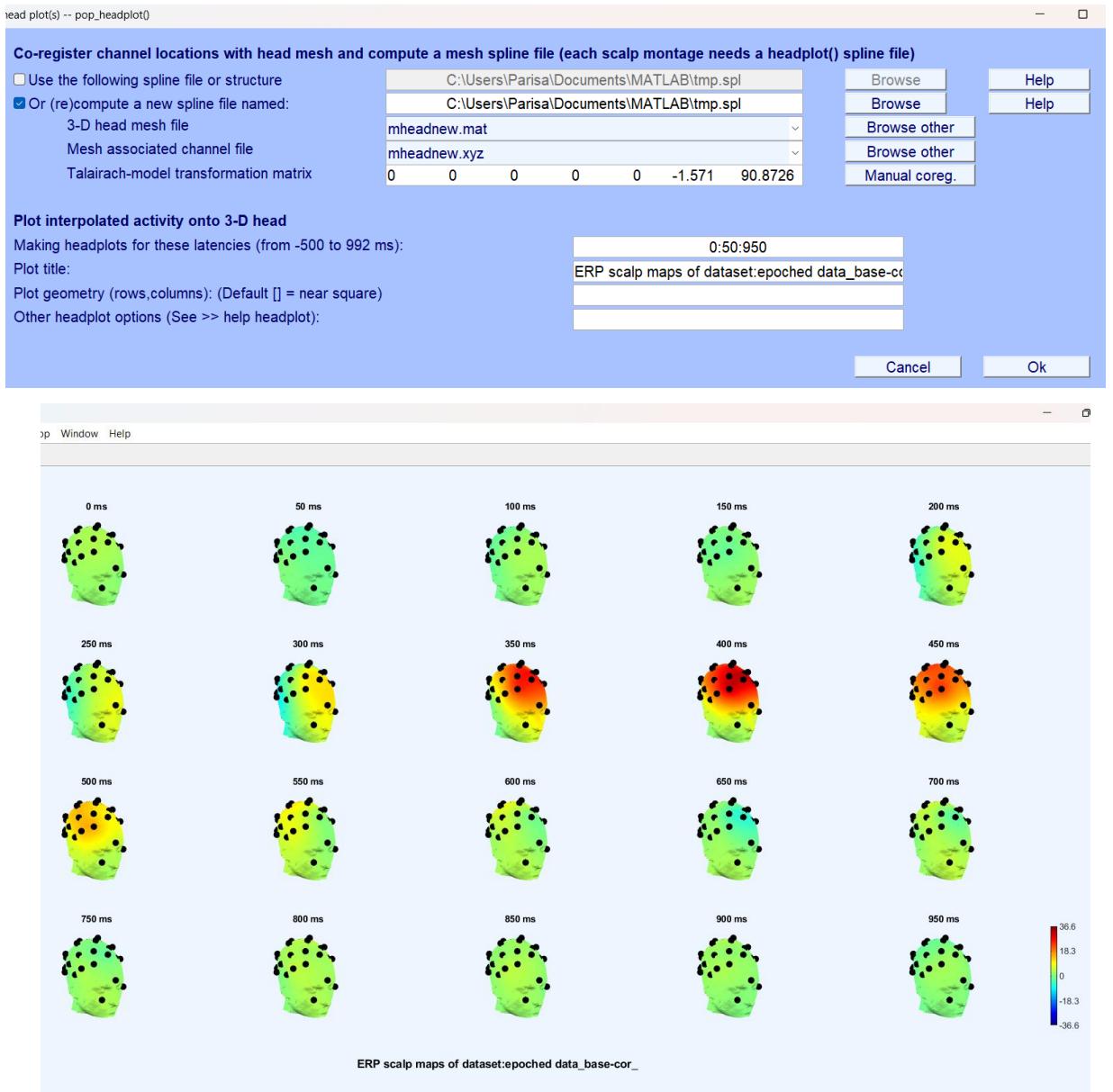
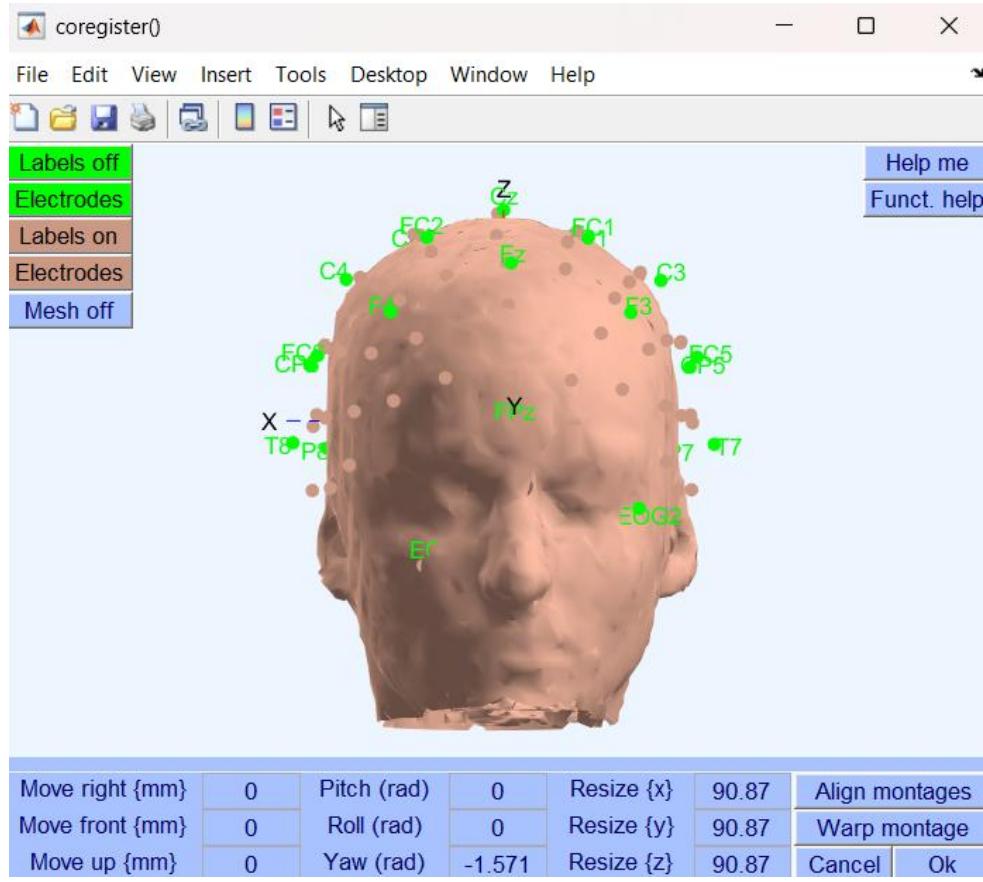
ERP

ERP series



ERP

ERP series



ERP

ERP series

