

Initial Analysis of n back data

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The initial stimulus presentation has already been removed per Ted, so these data reflect the first blank (maintenance), probe (probe / next stimulus presentation), and feedback(response/feedback) starting with the first time a relevant probe can be presented (so the amount of data cut off at the beginning depends on the n in the n-back).

This analysis is delaying exclusion of mistakes made by participants until later in the process. This becomes a bit tricky because which trials to exclude might depend on the n of the n-back. We should consult prior literature to see how this is typically dealt with. Draw out the relationship between stimulus and probe number for the same presented information.

First some notes about the data:

Channels:

Channels labeled 15 and 16 - TP9 and TP10 are not actually placed, they are placed on the mastiod. There was also a reference channel on the ear (enobio 20 channel electrode setup), so these could either be ignored or used as a reference.

Might also need to remove CP5 and FPZ from the study, showing up as bad for lots of subjects.

Other analysis / setup notes:

- Need to install the LIMO plugin to do a full analysis.
- If you can't get fieldtrip on mac, you might need to: sudo xattr -r -d com.apple.quarantine fieldtrip-20230427

References for analysis choices:

EEG is better left alone: <https://www.nature.com/articles/s41598-023-27528-0#Sec18>

Analysis Setup

Each subject folder contains a subfolder called 1, 2, or 3 for the n of the nback.

```
dir_data = "nback_study_VR_EEG_data";
numBack = 1:3; % list of which n-back folders to include

%subjNames = {'A02','A04','A05','A07'};
subjNames =
{'A02','A04','A05','A07','A08','A10','A11','A12','A13','A14','A15','A16','A17','A18','A19','A20','A21','A22','A23','A24','A27','A28'};
%subjNames =
{'A02','A04','A05','A06','A07','A08','A09','A10','A11','A12','A13','A14','A15','A16','A17'};

options.plotsOn = true;
options.overwriteMarkerFiles = true; % Set to true if you want to redo from scratch (otherwise it will skip ones you've already done
options.overwritePreprocFiles = true; % Set to true if you want to redo from scratch (otherwise it will skip ones you've already done
options.preprocessingTag = 'D';

options.epochWindow = [0 3];
options.removebaseline = true;

options.refChannelsNames = {'TP9','TP10'}; % These are the mastiod channels, not actually TP9 and TP10. Either need to ignore them or rerefence against them.
%not used options.refChannels = 'remove'; % Options are 'remove' or 'reference' or 'ignore'
```

```

conditions =
{'blank_1','blank_2','blank_3','prob_1','prob_2','prob_3','feedback_1','feed
back_2','feedback_3'}; % conditions to extract
options.eventTypes = { 'blank','prob','feedback'};

subjeventsclean = zeros(length(subjNames),length(options.eventTypes));

% If eeglab not loaded, load it
if ~exist('pop_loadset'), eeglab; end %#ok<EXIST>

options.data_dir = '../nback_study_VR_EEG_data/';
options.filename_base = 'upevent';
options.prefixPhase1 = 'mark';
options.prefixPhase2 = 'Preproc';
%options.saveToPhase3 = '../nback_study_VR_EEG_data/Group/Preprocessing/
Epoch/';
%options.prefixPhase3 = 'epochByCode'; % Epoch them at the code marker
% Epoch the data again by each of the task phases
options.saveToPhase4 = strcat('./Data/Group/
EpochsForAnalysis/','Preproc',options.preprocessingTag,'/');
options.prefixPhase4 = 'CBSepoch_';

% If you don't have picard ica installed already:
%plugin_askinstall('PICARD','picard',1)
% Only store one dataset in memory at a time.
%pop_editoptions( 'option_storedisk', 1); % only one dataset in memory at a
time

```

Phase 1: Fix markers

```

% Loop through all subjects.
for s = 1:length(subjNames)

    subjName = subjNames{s};
    %fprintf("Processing subject: %s \n", subjName)

    for n = numBack
        fprintf("Processing subject: %s for folder %s \n",subjName,
num2str(n))
        temp_subj_folder = fullfile(options.data_dir,subjName,num2str(n));
        temp_filename_in =
        strcat(subjName,'_',num2str(n),'_',options.filename_base,'.set');

```

```

        temp_filename_out =
strcat(subjName,'_',num2str(n),'_',options.filename_base,'_',options.prefixP
hase1,'.set');

    if ~options.overwriteMarkerFiles &&
exist(fullfile(temp_subj_folder,temp_filename_out),'file') > 0
        %If don't overwrite and file exists, then skip
        fprintf("File already exists... skipping... ")
    else
        % Find original raw data file
        rawDataFile = fullfile(temp_subj_folder,temp_filename_in);
        try
            EEG = pop_loadset('filename',rawDataFile);
        catch SE
            disp(SE)
            EEG = [];
        end

```

Fix event markers

Each subject did 50 of each n-back condition number (1,2,3) in ascending order.

Go through each of the events and organize them for grouping. Make sure you only run this once.

```

EEG = fixNBackMarkers(EEG,n);

EEG = eeg_checkset(EEG);
% Save data
fprintf(strcat("Saving data for ", subjName, " with filename: "
, temp_filename_out, "\n"))
EEG =
pop_saveset(EEG,'filename',temp_filename_out,'filepath',temp_subj_folder);
end
end
end

```

```

Processing subject: A02 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/1/A02_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A02/1/A02_1_upevent.fdt'...
Saving data for A02 with filename: A02_1_upevent_mark.set
Saving dataset...
Processing subject: A02 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/2/A02_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A02/2/A02_2_upevent.fdt'...
Saving data for A02 with filename: A02_2_upevent_mark.set
Saving dataset...
Processing subject: A02 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/3/A02_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A02/3/A02_3_upevent.fdt'...
Saving data for A02 with filename: A02_3_upevent_mark.set

```

```
Saving dataset...
Processing subject: A04 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/1/A04_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A04/1/A04_1_upevent.fdt'...
Saving data for A04 with filename: A04_1_upevent_mark.set
Saving dataset...
Processing subject: A04 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/2/A04_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A04/2/A04_2_upevent.fdt'...
Saving data for A04 with filename: A04_2_upevent_mark.set
Saving dataset...
Processing subject: A04 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/3/A04_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A04/3/A04_3_upevent.fdt'...
Saving data for A04 with filename: A04_3_upevent_mark.set
Saving dataset...
Processing subject: A05 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/1/A05_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A05/1/A05_1_upevent.fdt'...
Saving data for A05 with filename: A05_1_upevent_mark.set
Saving dataset...
Processing subject: A05 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/2/A05_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A05/2/A05_2_upevent.fdt'...
Saving data for A05 with filename: A05_2_upevent_mark.set
Saving dataset...
Processing subject: A05 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/3/A05_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A05/3/A05_3_upevent.fdt'...
Saving data for A05 with filename: A05_3_upevent_mark.set
Saving dataset...
Processing subject: A07 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/1/A07_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A07/1/A07_1_upevent.fdt'...
Saving data for A07 with filename: A07_1_upevent_mark.set
Saving dataset...
Processing subject: A07 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/2/A07_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A07/2/A07_2_upevent.fdt'...
Saving data for A07 with filename: A07_2_upevent_mark.set
Saving dataset...
Processing subject: A07 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/3/A07_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A07/3/A07_3_upevent.fdt'...
Saving data for A07 with filename: A07_3_upevent_mark.set
Saving dataset...
Processing subject: A08 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/1/A08_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A08/1/A08_1_upevent.fdt'...
Saving data for A08 with filename: A08_1_upevent_mark.set
Saving dataset...
Processing subject: A08 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/2/A08_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
```

```
Reading float file '../nback_study_VR_EEG_data/A08/2/A08_2_upevent.fdt'...
Saving data for A08 with filename: A08_2_upevent_mark.set
Saving dataset...
Processing subject: A08 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/3/A08_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A08/3/A08_3_upevent.fdt'...
Saving data for A08 with filename: A08_3_upevent_mark.set
Saving dataset...
Processing subject: A10 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A10/1/A10_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A10/1/A10_1_upevent.fdt'...
Saving data for A10 with filename: A10_1_upevent_mark.set
Saving dataset...
Processing subject: A10 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A10/2/A10_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A10/2/A10_2_upevent.fdt'...
Saving data for A10 with filename: A10_2_upevent_mark.set
Saving dataset...
Processing subject: A10 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A10/3/A10_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A10/3/A10_3_upevent.fdt'...
Saving data for A10 with filename: A10_3_upevent_mark.set
Saving dataset...
Processing subject: A11 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/1/A11_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A11/1/A11_1_upevent.fdt'...
Saving data for A11 with filename: A11_1_upevent_mark.set
Saving dataset...
Processing subject: A11 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/2/A11_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A11/2/A11_2_upevent.fdt'...
Saving data for A11 with filename: A11_2_upevent_mark.set
Saving dataset...
Processing subject: A11 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/3/A11_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A11/3/A11_3_upevent.fdt'...
Saving data for A11 with filename: A11_3_upevent_mark.set
Saving dataset...
Processing subject: A12 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/1/A12_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A12/1/A12_1_upevent.fdt'...
Saving data for A12 with filename: A12_1_upevent_mark.set
Saving dataset...
Processing subject: A12 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/2/A12_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A12/2/A12_2_upevent.fdt'...
Saving data for A12 with filename: A12_2_upevent_mark.set
Saving dataset...
Processing subject: A12 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/3/A12_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A12/3/A12_3_upevent.fdt'...
Saving data for A12 with filename: A12_3_upevent_mark.set
Saving dataset...
Processing subject: A13 for folder 1
```

```
pop_loadset(): loading file ../nback_study_VR_EEG_data/A13/1/A13_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A13/1/A13_1_upevent.fdt'...
Saving data for A13 with filename: A13_1_upevent_mark.set
Saving dataset...
Processing subject: A13 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A13/2/A13_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A13/2/A13_2_upevent.fdt'...
Saving data for A13 with filename: A13_2_upevent_mark.set
Saving dataset...
Processing subject: A13 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A13/3/A13_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A13/3/A13_3_upevent.fdt'...
Saving data for A13 with filename: A13_3_upevent_mark.set
Saving dataset...
Processing subject: A14 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A14/1/A14_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A14/1/A14_1_upevent.fdt'...
Saving data for A14 with filename: A14_1_upevent_mark.set
Saving dataset...
Processing subject: A14 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A14/2/A14_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A14/2/A14_2_upevent.fdt'...
Saving data for A14 with filename: A14_2_upevent_mark.set
Saving dataset...
Processing subject: A14 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A14/3/A14_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A14/3/A14_3_upevent.fdt'...
Saving data for A14 with filename: A14_3_upevent_mark.set
Saving dataset...
Processing subject: A15 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/1/A15_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A15/1/A15_1_upevent.fdt'...
Saving data for A15 with filename: A15_1_upevent_mark.set
Saving dataset...
Processing subject: A15 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/2/A15_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A15/2/A15_2_upevent.fdt'...
Saving data for A15 with filename: A15_2_upevent_mark.set
Saving dataset...
Processing subject: A15 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/3/A15_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A15/3/A15_3_upevent.fdt'...
Saving data for A15 with filename: A15_3_upevent_mark.set
Saving dataset...
Processing subject: A16 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A16/1/A16_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A16/1/A16_1_upevent.fdt'...
Saving data for A16 with filename: A16_1_upevent_mark.set
Saving dataset...
Processing subject: A16 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A16/2/A16_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A16/2/A16_2_upevent.fdt'...
Saving data for A16 with filename: A16_2_upevent_mark.set
```

```
Saving dataset...
Processing subject: A16 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A16/3/A16_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A16/3/A16_3_upevent.fdt'...
Saving data for A16 with filename: A16_3_upevent_mark.set
Saving dataset...
Processing subject: A17 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A17/1/A17_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A17/1/A17_1_upevent.fdt'...
Saving data for A17 with filename: A17_1_upevent_mark.set
Saving dataset...
Processing subject: A17 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A17/2/A17_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A17/2/A17_2_upevent.fdt'...
Saving data for A17 with filename: A17_2_upevent_mark.set
Saving dataset...
Processing subject: A17 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A17/3/A17_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A17/3/A17_3_upevent.fdt'...
Saving data for A17 with filename: A17_3_upevent_mark.set
Saving dataset...
Processing subject: A18 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/1/A18_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A18/1/A18_1_upevent.fdt'...
Saving data for A18 with filename: A18_1_upevent_mark.set
Saving dataset...
Processing subject: A18 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/2/A18_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A18/2/A18_2_upevent.fdt'...
Saving data for A18 with filename: A18_2_upevent_mark.set
Saving dataset...
Processing subject: A18 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/3/A18_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A18/3/A18_3_upevent.fdt'...
Saving data for A18 with filename: A18_3_upevent_mark.set
Saving dataset...
Processing subject: A19 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A19/1/A19_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A19/1/A19_1_upevent.fdt'...
Saving data for A19 with filename: A19_1_upevent_mark.set
Saving dataset...
Processing subject: A19 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A19/2/A19_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A19/2/A19_2_upevent.fdt'...
Saving data for A19 with filename: A19_2_upevent_mark.set
Saving dataset...
Processing subject: A19 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A19/3/A19_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A19/3/A19_3_upevent.fdt'...
Saving data for A19 with filename: A19_3_upevent_mark.set
Saving dataset...
Processing subject: A20 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/1/A20_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
```

```
Reading float file '../nback_study_VR_EEG_data/A20/1/A20_1_upevent.fdt'...
Saving data for A20 with filename: A20_1_upevent_mark.set
Saving dataset...
Processing subject: A20 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/2/A20_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A20/2/A20_2_upevent.fdt'...
Saving data for A20 with filename: A20_2_upevent_mark.set
Saving dataset...
Processing subject: A20 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/3/A20_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A20/3/A20_3_upevent.fdt'...
Saving data for A20 with filename: A20_3_upevent_mark.set
Saving dataset...
Processing subject: A21 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A21/1/A21_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A21/1/A21_1_upevent.fdt'...
Saving data for A21 with filename: A21_1_upevent_mark.set
Saving dataset...
Processing subject: A21 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A21/2/A21_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A21/2/A21_2_upevent.fdt'...
Saving data for A21 with filename: A21_2_upevent_mark.set
Saving dataset...
Processing subject: A21 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A21/3/A21_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A21/3/A21_3_upevent.fdt'...
Saving data for A21 with filename: A21_3_upevent_mark.set
Saving dataset...
Processing subject: A22 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/1/A22_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A22/1/A22_1_upevent.fdt'...
Saving data for A22 with filename: A22_1_upevent_mark.set
Saving dataset...
Processing subject: A22 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/2/A22_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A22/2/A22_2_upevent.fdt'...
Saving data for A22 with filename: A22_2_upevent_mark.set
Saving dataset...
Processing subject: A22 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/3/A22_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A22/3/A22_3_upevent.fdt'...
Saving data for A22 with filename: A22_3_upevent_mark.set
Saving dataset...
Processing subject: A23 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A23/1/A23_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A23/1/A23_1_upevent.fdt'...
Saving data for A23 with filename: A23_1_upevent_mark.set
Saving dataset...
Processing subject: A23 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A23/2/A23_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A23/2/A23_2_upevent.fdt'...
Saving data for A23 with filename: A23_2_upevent_mark.set
Saving dataset...
Processing subject: A23 for folder 3
```

```
pop_loadset(): loading file ../nback_study_VR_EEG_data/A23/3/A23_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A23/3/A23_3_upevent.fdt'...
Saving data for A23 with filename: A23_3_upevent_mark.set
Saving dataset...
Processing subject: A24 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/1/A24_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A24/1/A24_1_upevent.fdt'...
Saving data for A24 with filename: A24_1_upevent_mark.set
Saving dataset...
Processing subject: A24 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/2/A24_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A24/2/A24_2_upevent.fdt'...
Saving data for A24 with filename: A24_2_upevent_mark.set
Saving dataset...
Processing subject: A24 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/3/A24_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A24/3/A24_3_upevent.fdt'...
Saving data for A24 with filename: A24_3_upevent_mark.set
Saving dataset...
Processing subject: A27 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/1/A27_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A27/1/A27_1_upevent.fdt'...
Saving data for A27 with filename: A27_1_upevent_mark.set
Saving dataset...
Processing subject: A27 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/2/A27_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A27/2/A27_2_upevent.fdt'...
Saving data for A27 with filename: A27_2_upevent_mark.set
Saving dataset...
Processing subject: A27 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/3/A27_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A27/3/A27_3_upevent.fdt'...
Saving data for A27 with filename: A27_3_upevent_mark.set
Saving dataset...
Processing subject: A28 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/1/A28_1_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A28/1/A28_1_upevent.fdt'...
Saving data for A28 with filename: A28_1_upevent_mark.set
Saving dataset...
Processing subject: A28 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/2/A28_2_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A28/2/A28_2_upevent.fdt'...
Saving data for A28 with filename: A28_2_upevent_mark.set
Saving dataset...
Processing subject: A28 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/3/A28_3_upevent.set ...
Warning: Inconsistency between urevent (backup) and event structures, removing urevent structure
Reading float file '../nback_study_VR_EEG_data/A28/3/A28_3_upevent.fdt'...
Saving data for A28 with filename: A28_3_upevent_mark.set
Saving dataset...
```

Phase 2: Preprocessing Pre-Epoching

Analysis will be built based on: https://github.com/sccn/eeg_pipelines and this paper: <https://www.nature.com/articles/s41598-023-27528-0>

" We use the default EEGLAB filter (see “[Methods](#)” sections) to high-pass the data from all datasets at 0.5 Hz in all analyses ", but others say 1-2 hz better for ICA, but worse for ERP.

Now must decide on preprocessing. Lots of debate in the field about this. Going with option D, which is the same as used in the Sternberg paper, so trying to keep the same preprocessing code and choices.

Begin looping through the subjects

```
for s = 1:length(subjNames)
    subjName = subjNames{s};
    for n = numBack
        fprintf("Processing subject: %s for folder %s \n",subjName,
num2str(n))
        temp_subj_folder = fullfile(options.data_dir,subjName,num2str(n));

        temp_filename_in =
strcat(subjName,'_',num2str(n),'_',options.filename_base,'_',options.prefixP
hase1,'.set');
        temp_filename_out =
strcat(subjName,'_',num2str(n),'_',options.filename_base,'_',options.prefixP
hase1,'_',options.prefixPhase2,options.preprocessingTag,'1.set');
```

Check to see if the file already exists to determine if you should skip this subject.

```
if ~options.overwritePreprocFiles &&
exist(fullfile(temp_subj_folder,temp_filename_out),'file') > 0
    fprintf("File already exists... skipping... \n")
    continue
end
```

Load the data

```
try
    EEG =
pop_loadset('filename',temp_filename_in,'filepath',temp_subj_folder);
    catch SE
        input(strcat("Error loading dataset for ", subjName))
        SE
    end
```

Preprocess the data: step 1

```
EEG = preprocessNBackEEG(EEG,'D1',options);
```

Save data

```

    fprintf(strcat("Saving data for ", subjName, " with filename: " ,
temp_filename_out,"\\n"))
    EEG =
pop_saveset(EEG, 'filename',temp_filename_out,'filepath',temp_subj_folder);
    end
end

```

Processing subject: A02 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/1/A02_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A02 with filename: A02_1_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A02 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/2/A02_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A02 with filename: A02_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A02 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/3/A02_3_upevent_mark.set ...

```

Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A02 with filename: A02_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A04 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/1/A04_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A04 with filename: A04_1_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A04 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/2/A04_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index

```

```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A04 with filename: A04_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A04 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/3/A04_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A04 with filename: A04_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A05 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/1/A05_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A05 with filename: A05_1_upevent_mark_PrepocD1.set
Saving dataset...

```

```

Processing subject: A05 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/2/A05_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A05 with filename: A05_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A05 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/3/A05_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A05 with filename: A05_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A07 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/1/A07_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
```

```

Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A07 with filename: A07_1_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A07 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/2/A07_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A07 with filename: A07_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A07 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/3/A07_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```

```

Saving data for A07 with filename: A07_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A08 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/1/A08_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A08 with filename: A08_1_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A08 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/2/A08_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A08 with filename: A08_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A08 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/3/A08_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities

```

```
Computing spectra (window length 500; fft length: 500; overlap 0):
```

```
.....
```

```
Plotting scalp distributions: ..
```

```
Click on each trace for channel/component index
```

```
Running cleanLineNoise (new version of cleanline)...
```

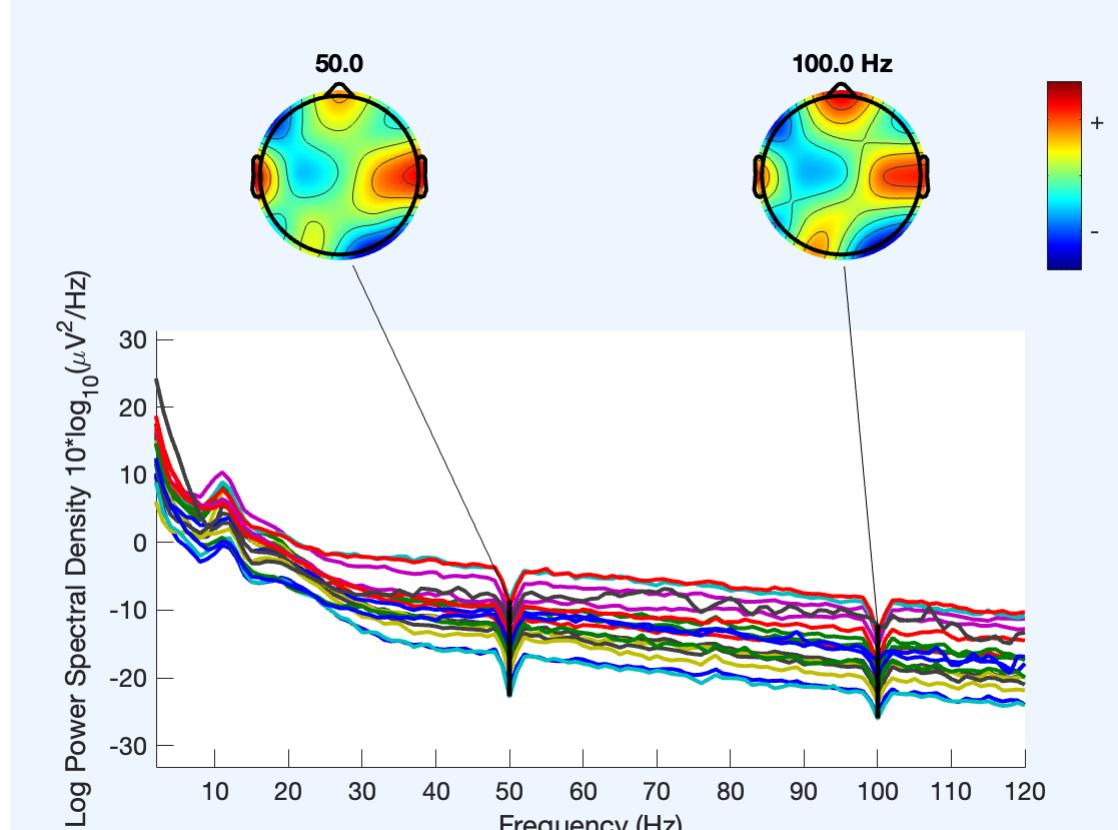
```
Pop_spectopo: finding data discontinuities
```

```
Computing spectra (window length 500; fft length: 500; overlap 0):
```

```
.....
```

```
Plotting scalp distributions: ..
```

```
Click on each trace for channel/component index
```



```
resampling data 250.0000 Hz
```

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
```

```
resampling event latencies...
```

```
resampling finished
```

```
Saving data for A08 with filename: A08_3_upevent_mark_PrepocD1.set
```

```
Saving dataset...
```

```
Processing subject: A10 for folder 1
```

```
pop_loadset(): loading file ../nback_study_VR_EEG_data/A10/1/A10_1_upevent_mark.set ...
```

```
Re-referencing data
```

```
pop_eegfiltnew() - performing 33001 point highpass filtering.
```

```
pop_eegfiltnew() - transition band width: 0.05 Hz
```

```
pop_eegfiltnew() - passband edge(s): 0.05 Hz
```

```
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
```

```
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
```

```
firfilt(): |=====| 100%, ETE 0:00
```

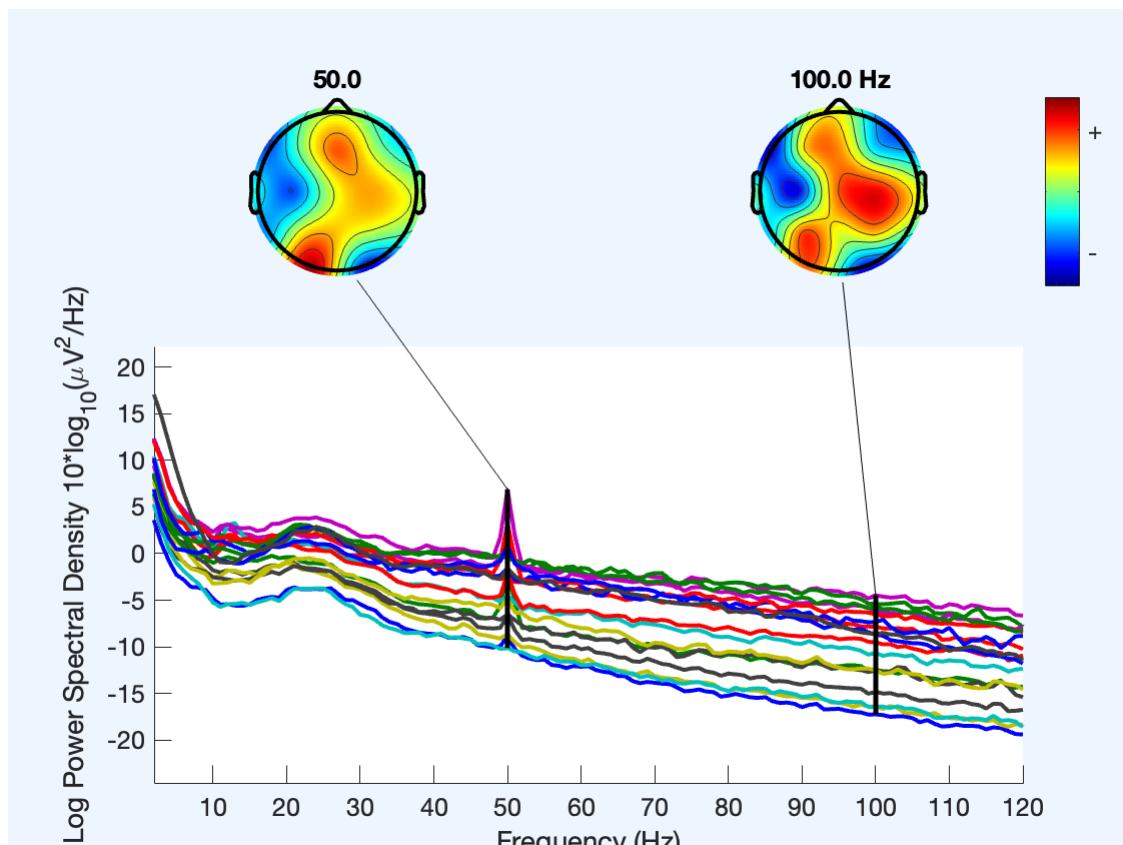
```
Pop_spectopo: finding data discontinuities
```

```
Computing spectra (window length 500; fft length: 500; overlap 0):
```

```
.....
```

```
Plotting scalp distributions: ..
```

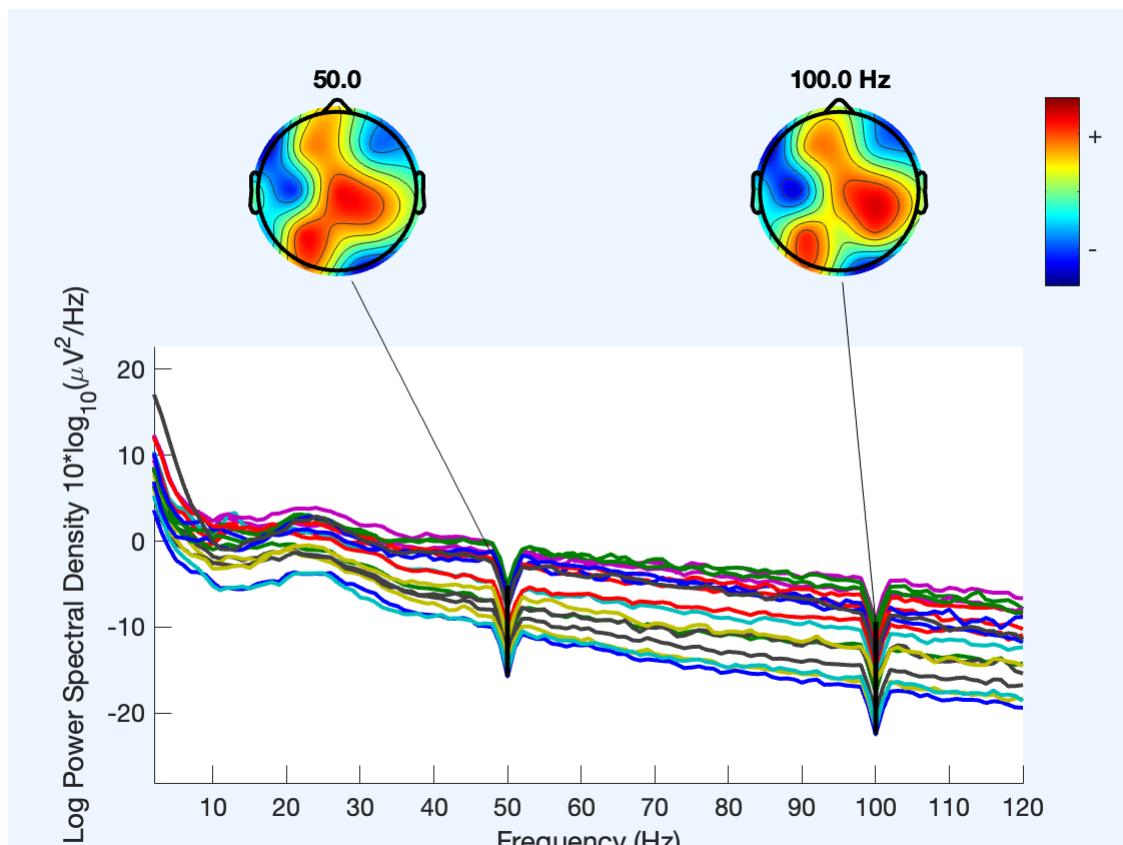
```
Click on each trace for channel/component index
```



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

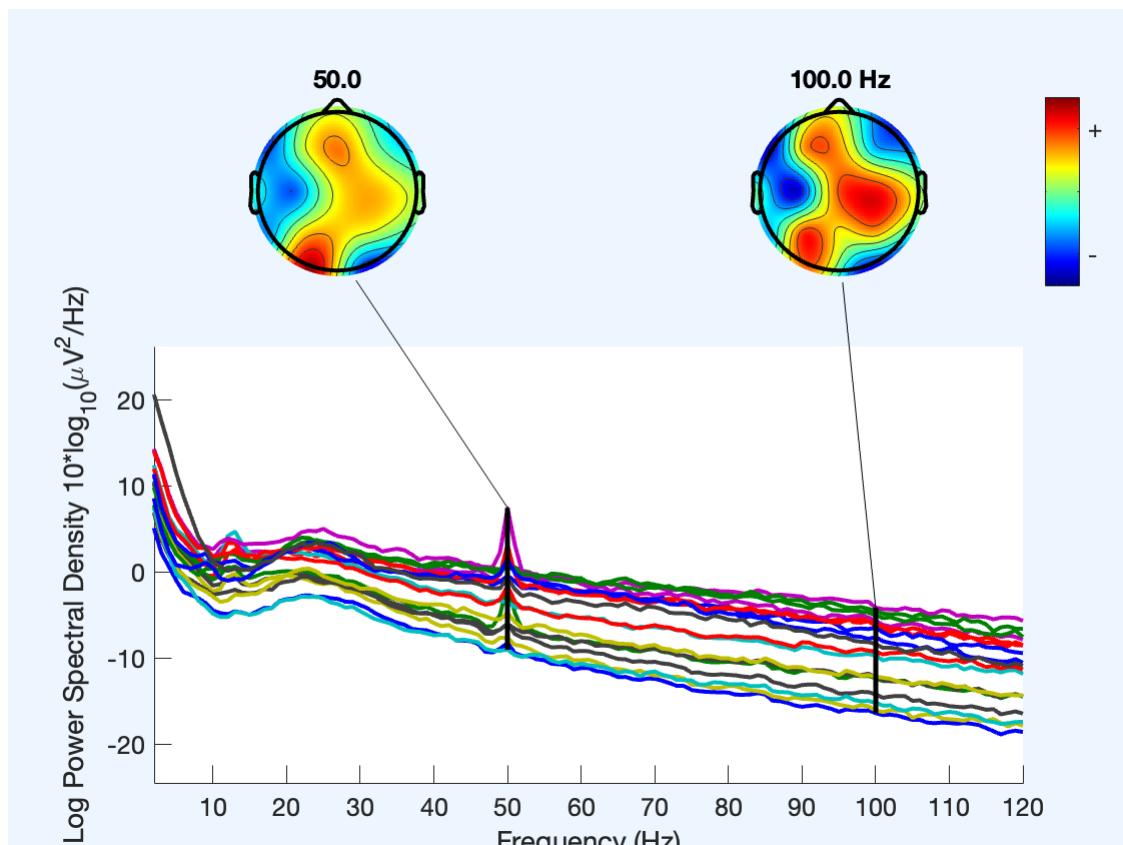
```



```

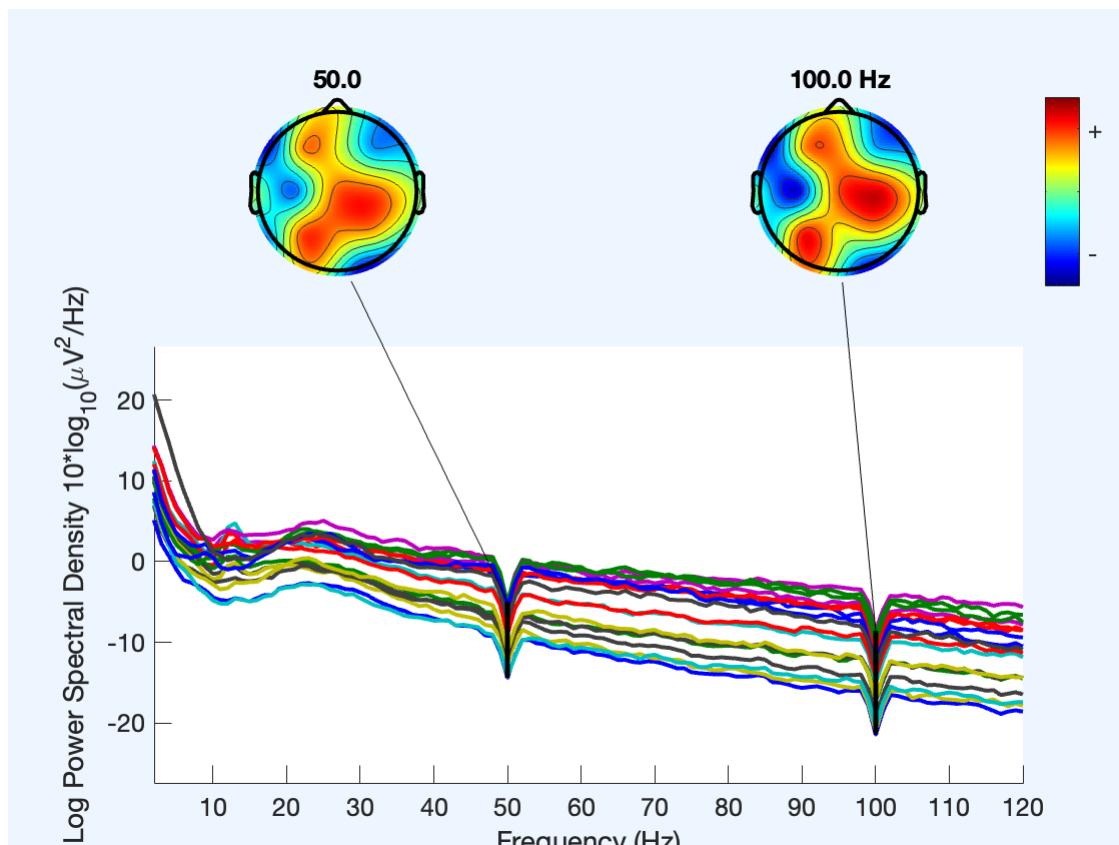
Saving data for A10 with filename: A10_1_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A10 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A10/2/A10_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ...
Click on each trace for channel/component index

```



Running cleanLineNoise (new version of cleanline)...
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

 Plotting scalp distributions: ..
 Click on each trace for channel/component index
 resampling data 250.0000 Hz
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
 resampling event latencies...
 resampling finished



Saving data for A10 with filename: A10_2_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A10 for folder 3

pop_loadset(): loading file/nback_study_VR_EEG_data/A10/3/A10_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

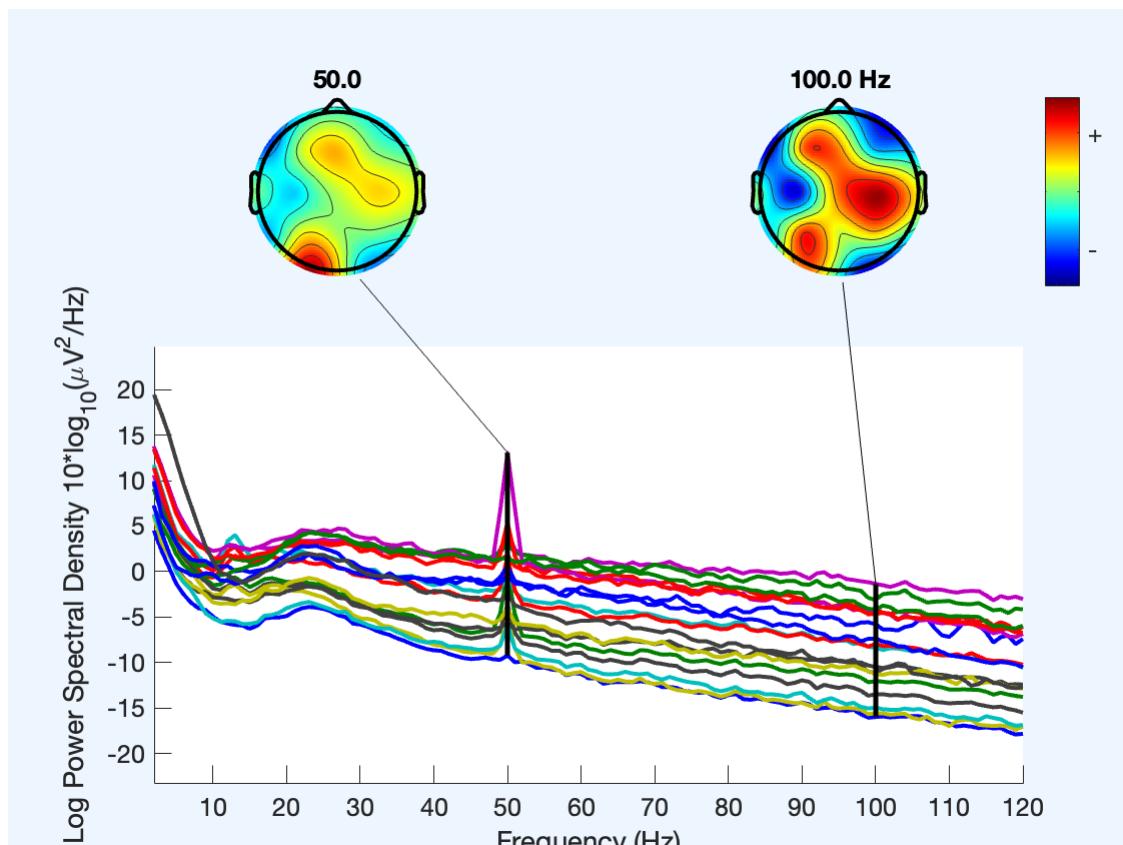
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

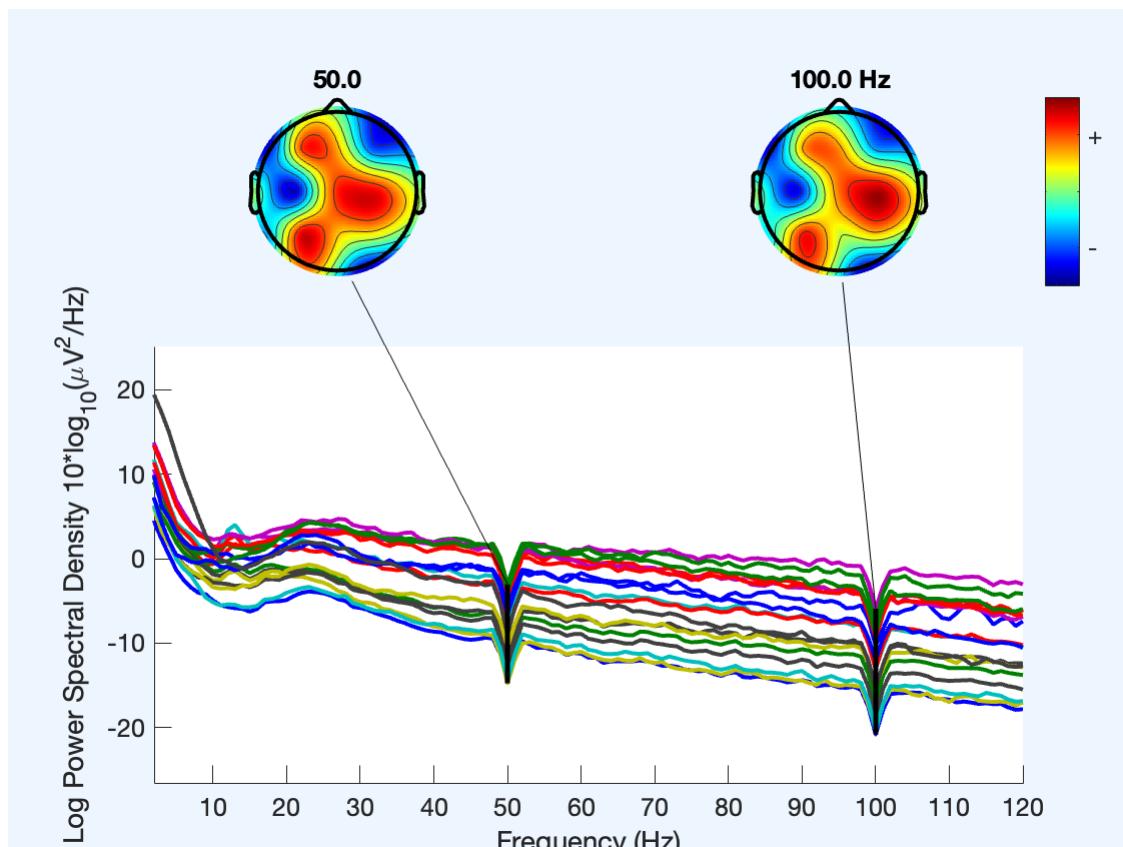
Click on each trace for channel/component index



```

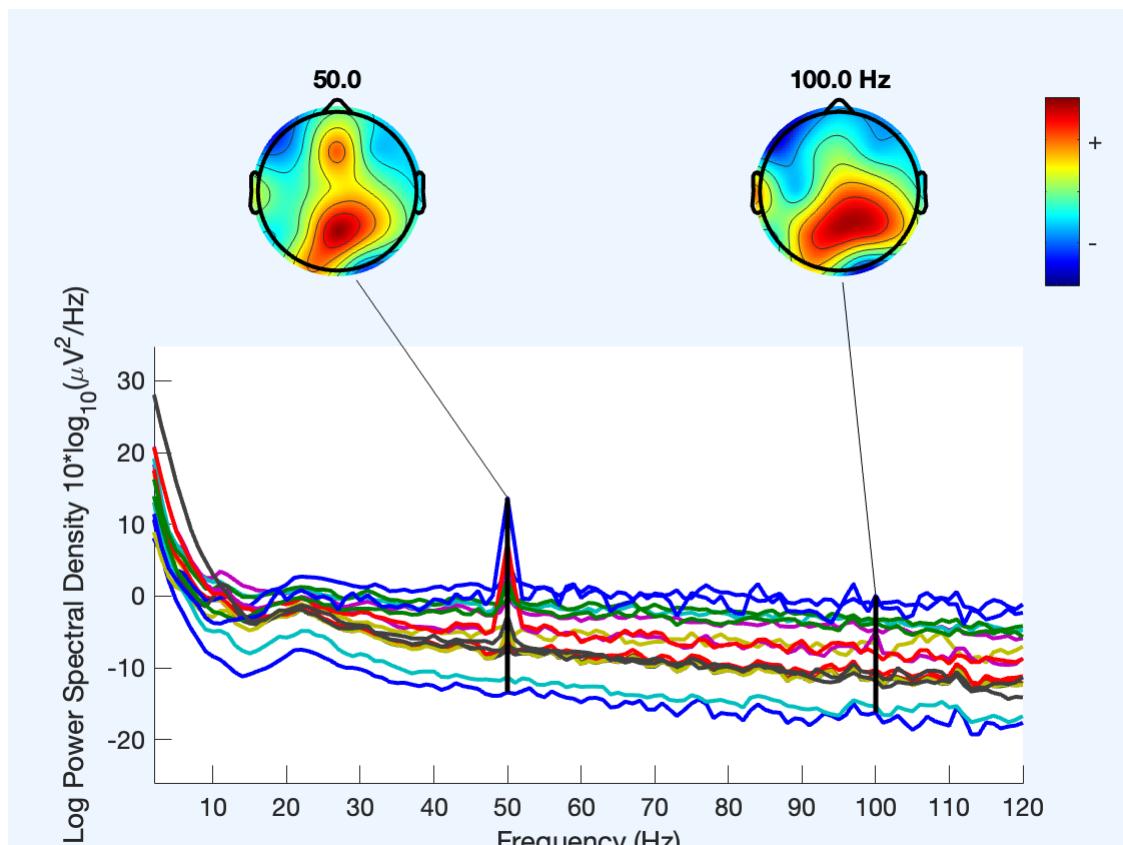
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A10 with filename: A10_3_upevent_mark_PrepocD1.set
 Saving dataset...
 Processing subject: A11 for folder 1
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/1/A11_1_upevent_mark.set ...
 Re-referencing data
 pop_eegfiltnew() - performing 33001 point highpass filtering.
 pop_eegfiltnew() - transition band width: 0.05 Hz
 pop_eegfiltnew() - passband edge(s): 0.05 Hz
 pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
 pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
 firfilt(): |=====| 100%, ETE 00:00
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

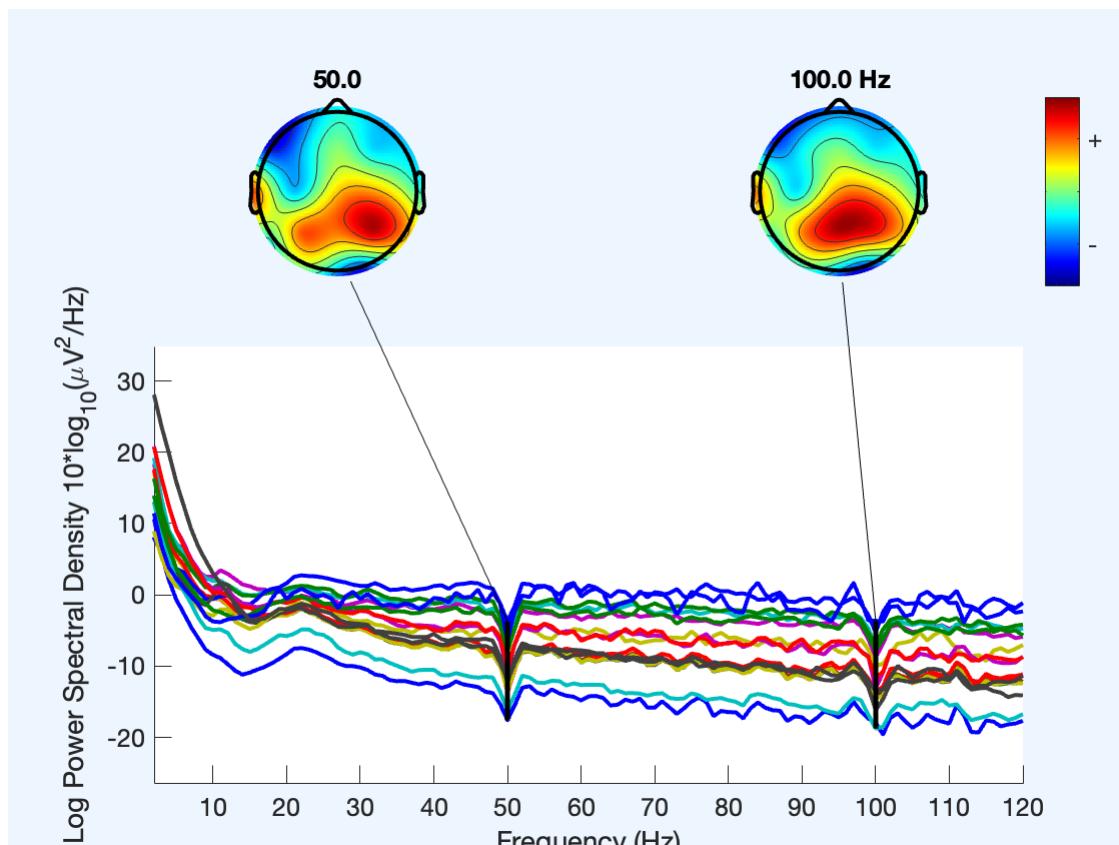
 Plotting scalp distributions: ...
 Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A11 with filename: A11_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A11 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/2/A11_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

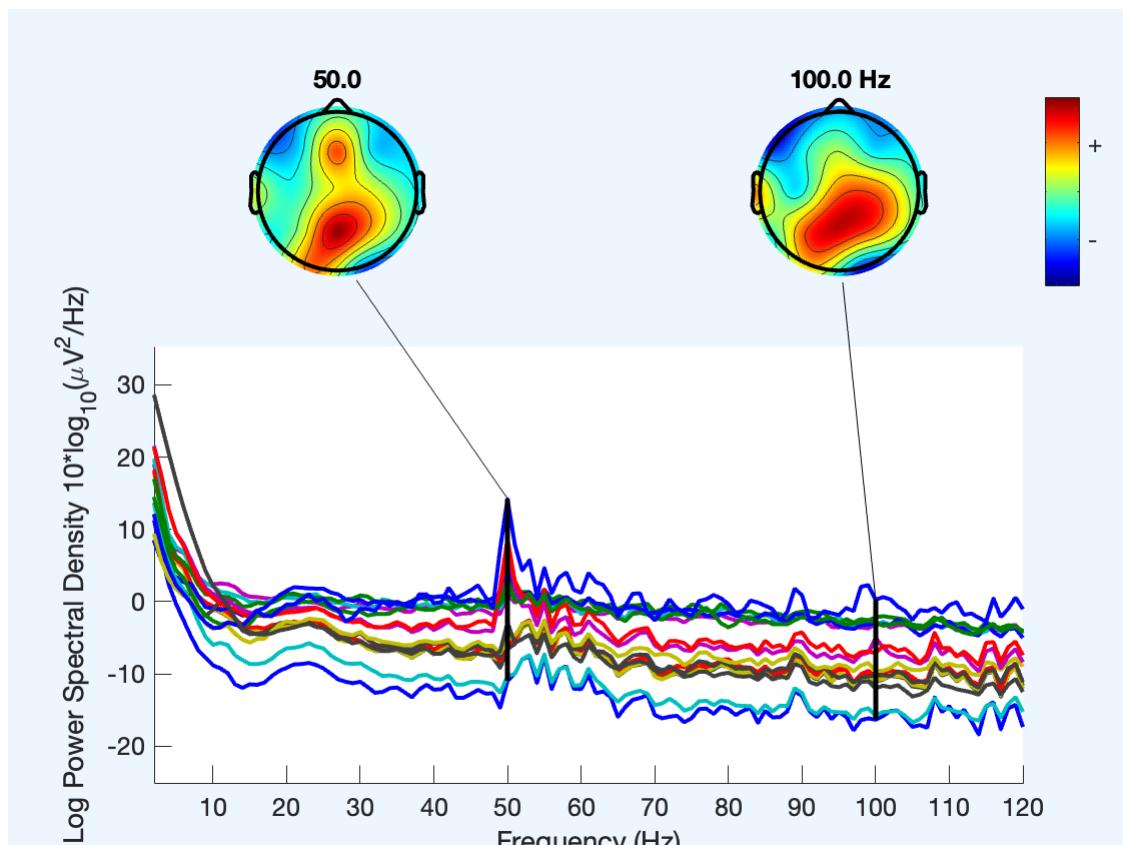
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

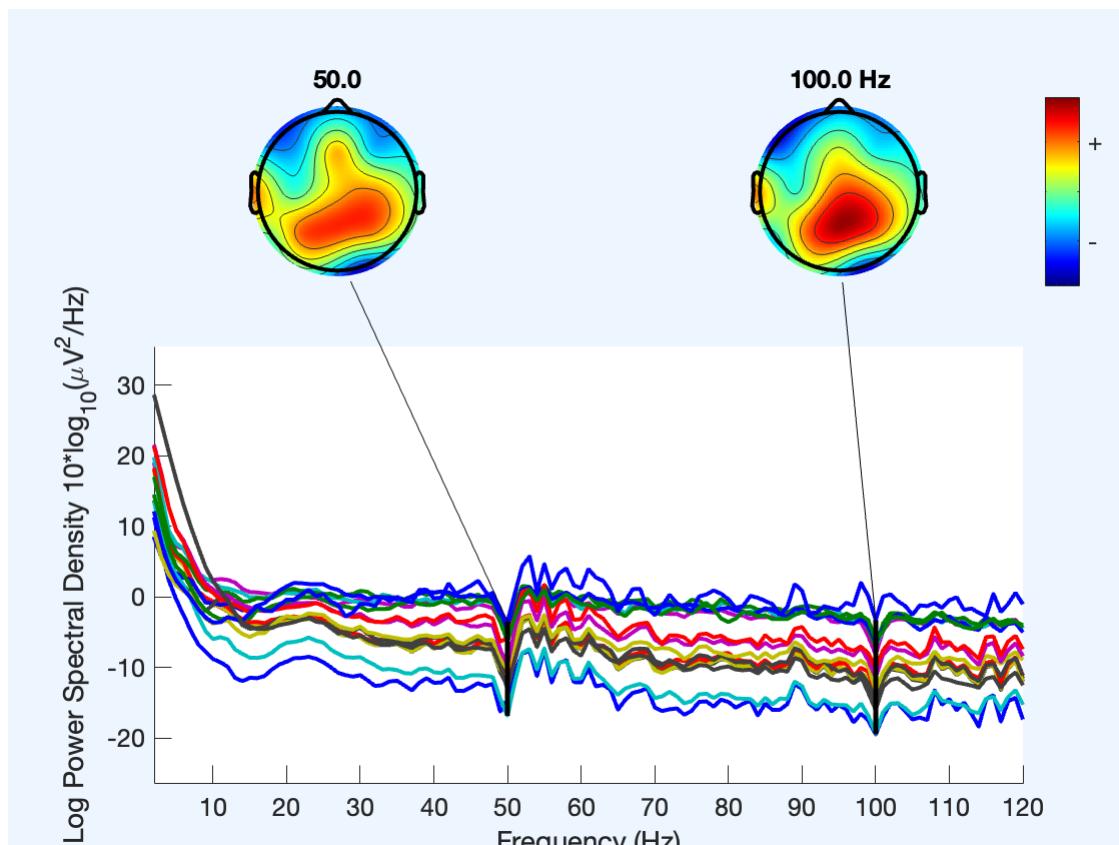
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A11 with filename: A11_2_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A11 for folder 3

pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/3/A11_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

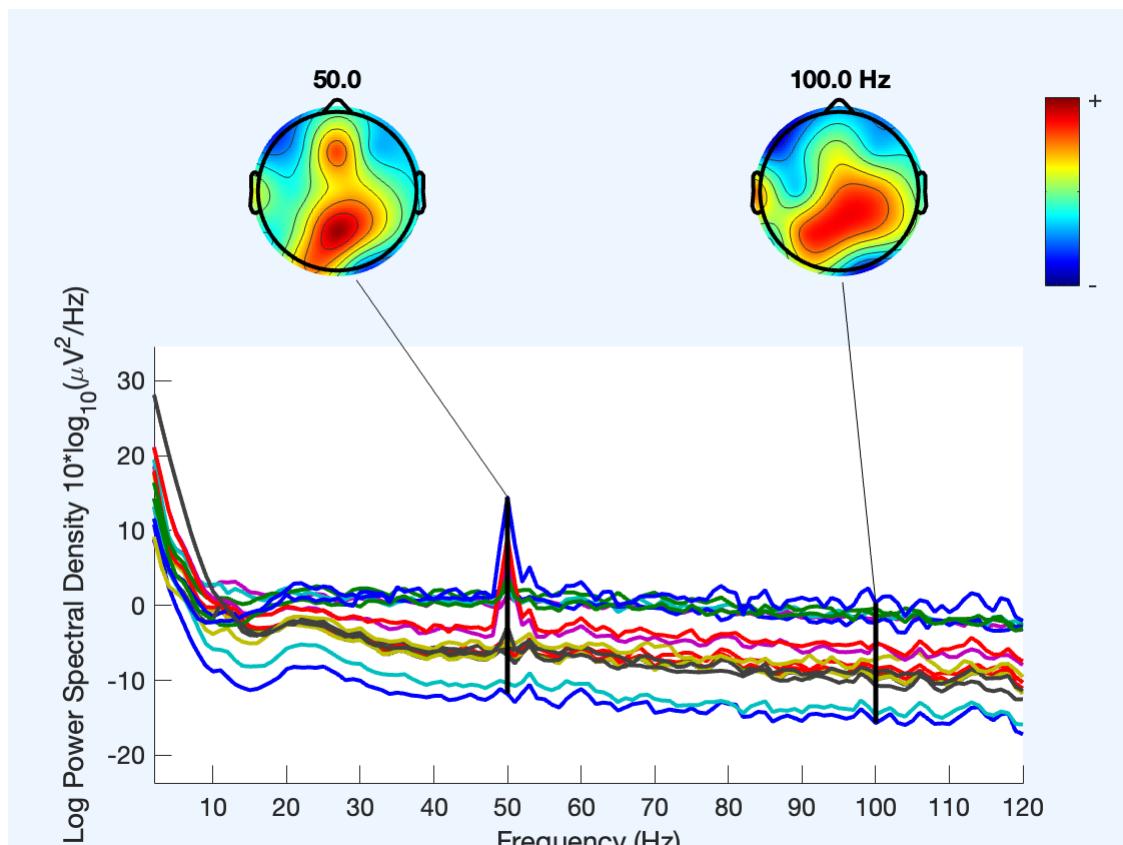
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

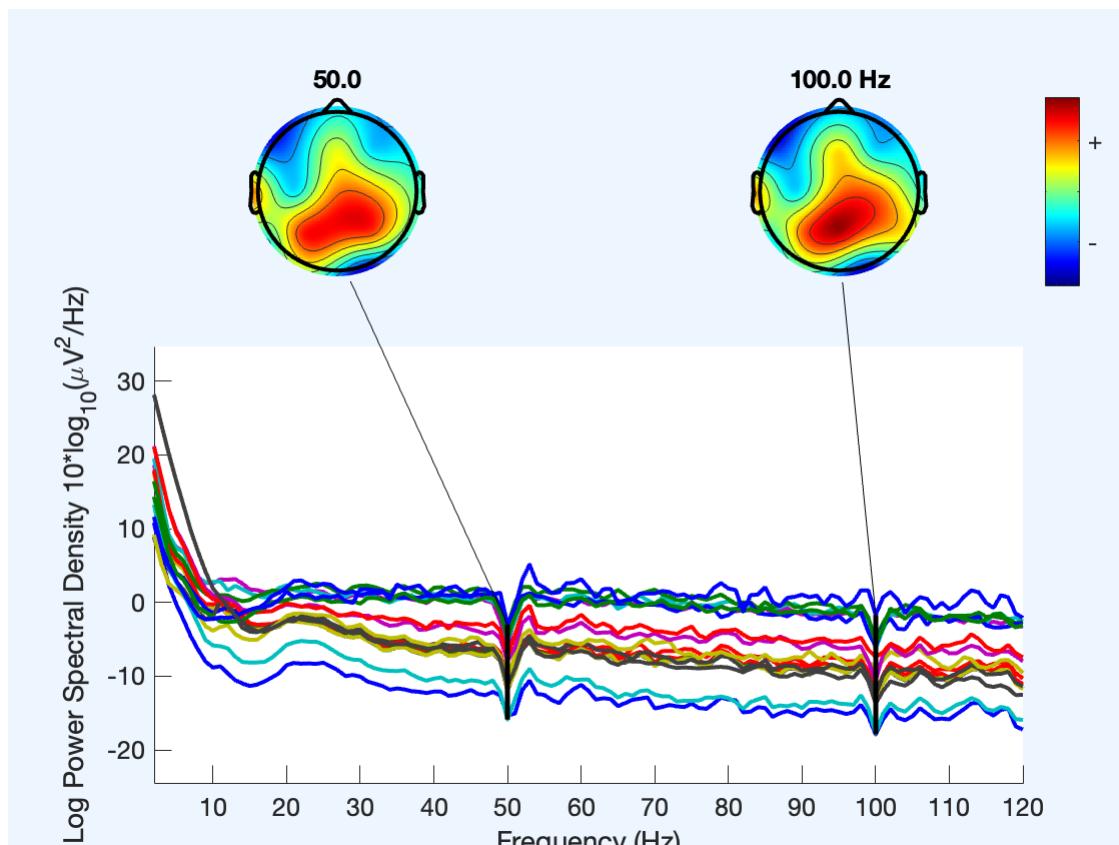
Plotting scalp distributions: ..

Click on each trace for channel/component index



Running cleanLineNoise (new version of cleanline)...
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

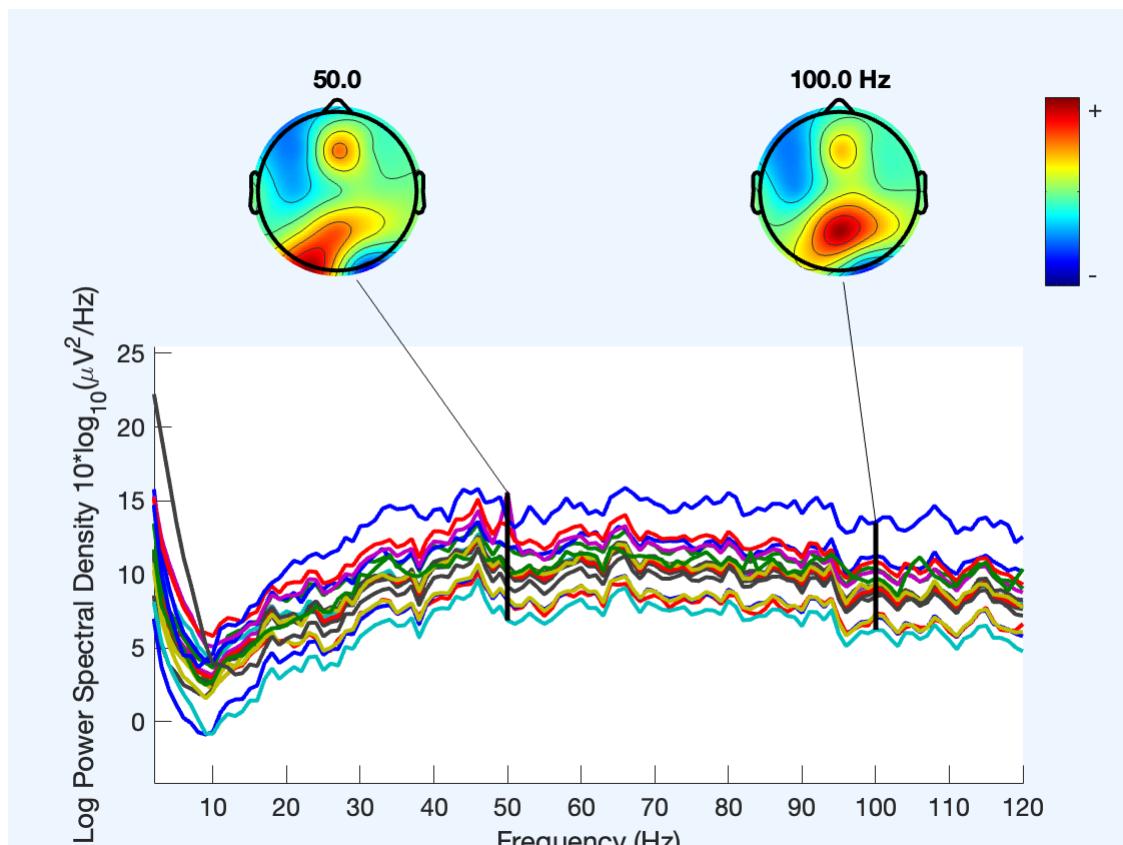
 Plotting scalp distributions: ..
 Click on each trace for channel/component index
 resampling data 250.0000 Hz
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



```

16 17 18
resampling event latencies...
resampling finished
Saving data for A11 with filename: A11_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A12 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/1/A12_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index

```



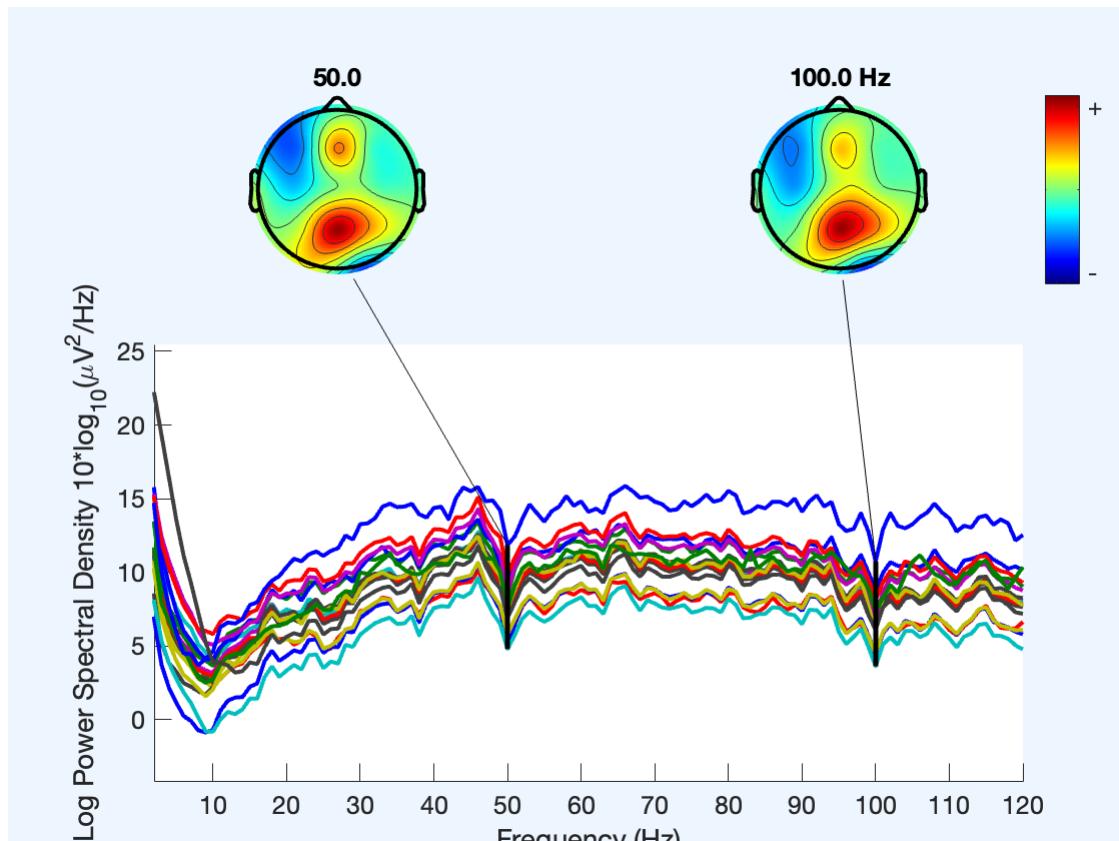
Running cleanLineNoise (new version of cleanline)...

Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....
Plotting scalp distributions: ..

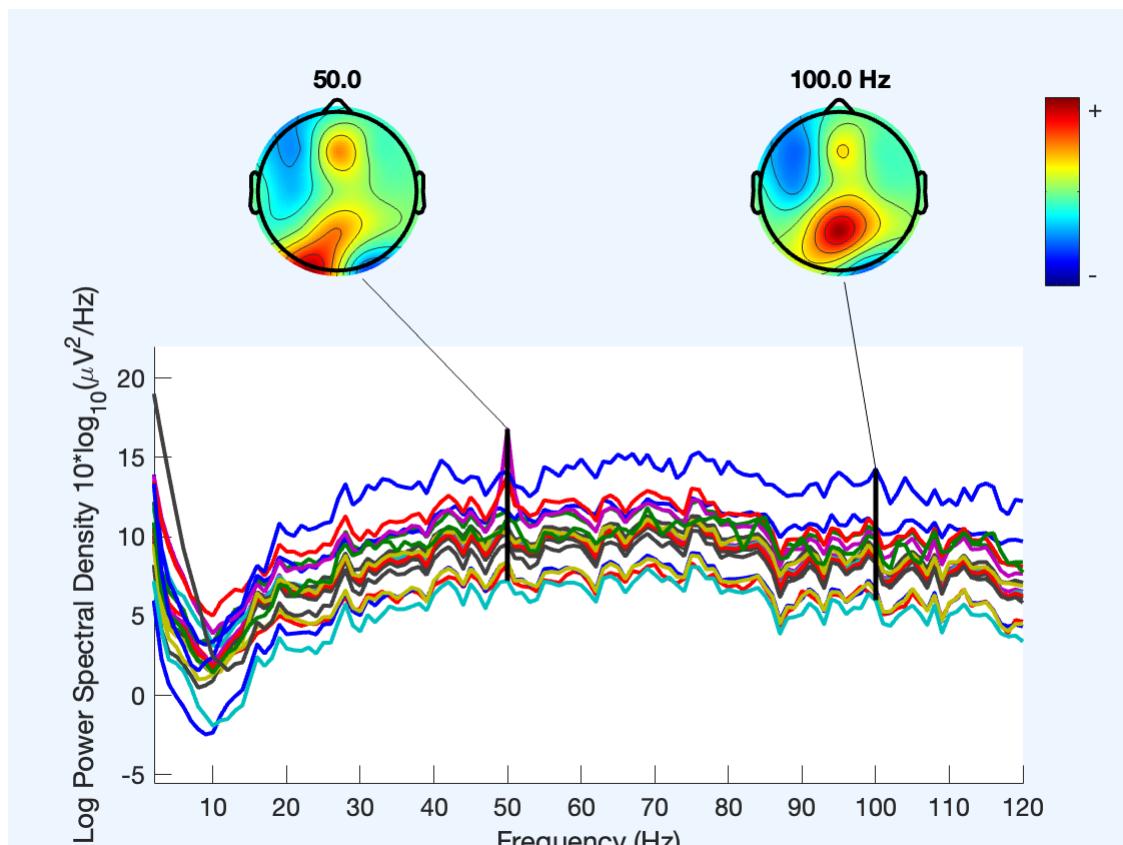
Click on each trace for channel/component index



```

resampling data 250.000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A12 with filename: A12_1_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A12 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/2/A12_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ...
Click on each trace for channel/component index

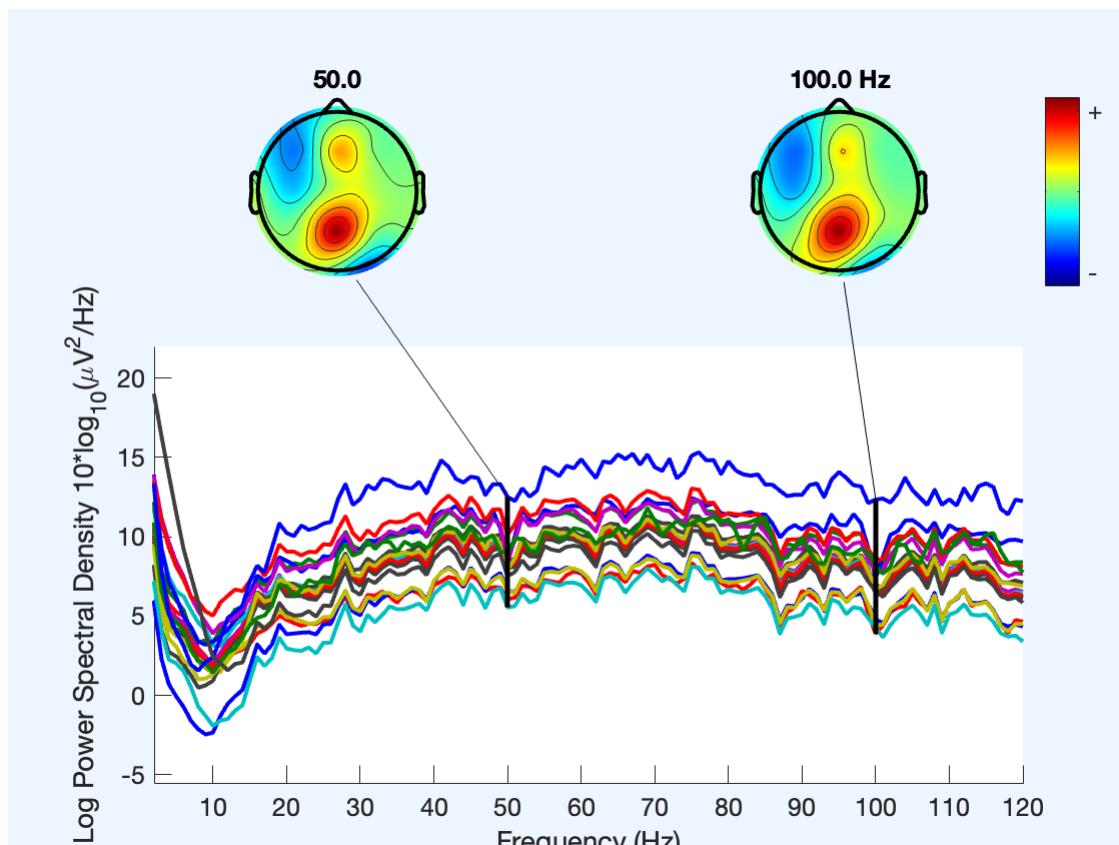
```



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A12 with filename: A12_2_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A12 for folder 3

pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/3/A12_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

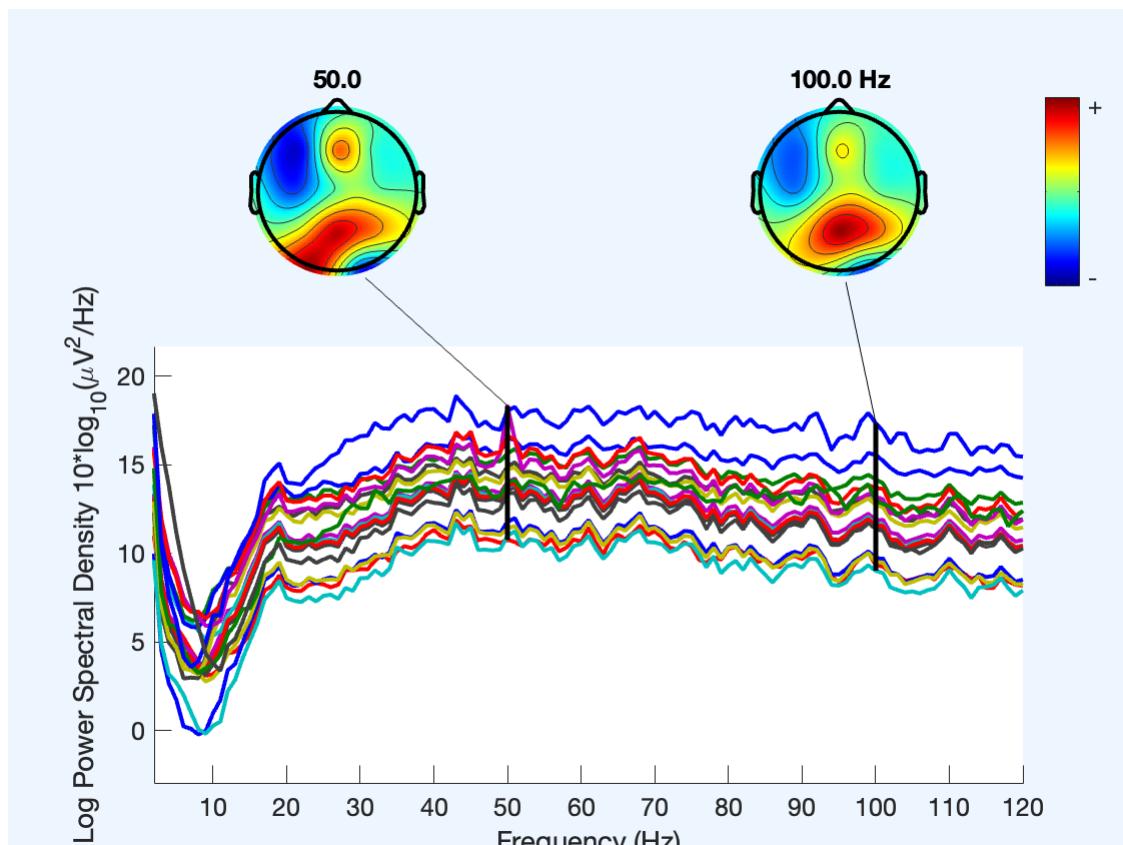
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

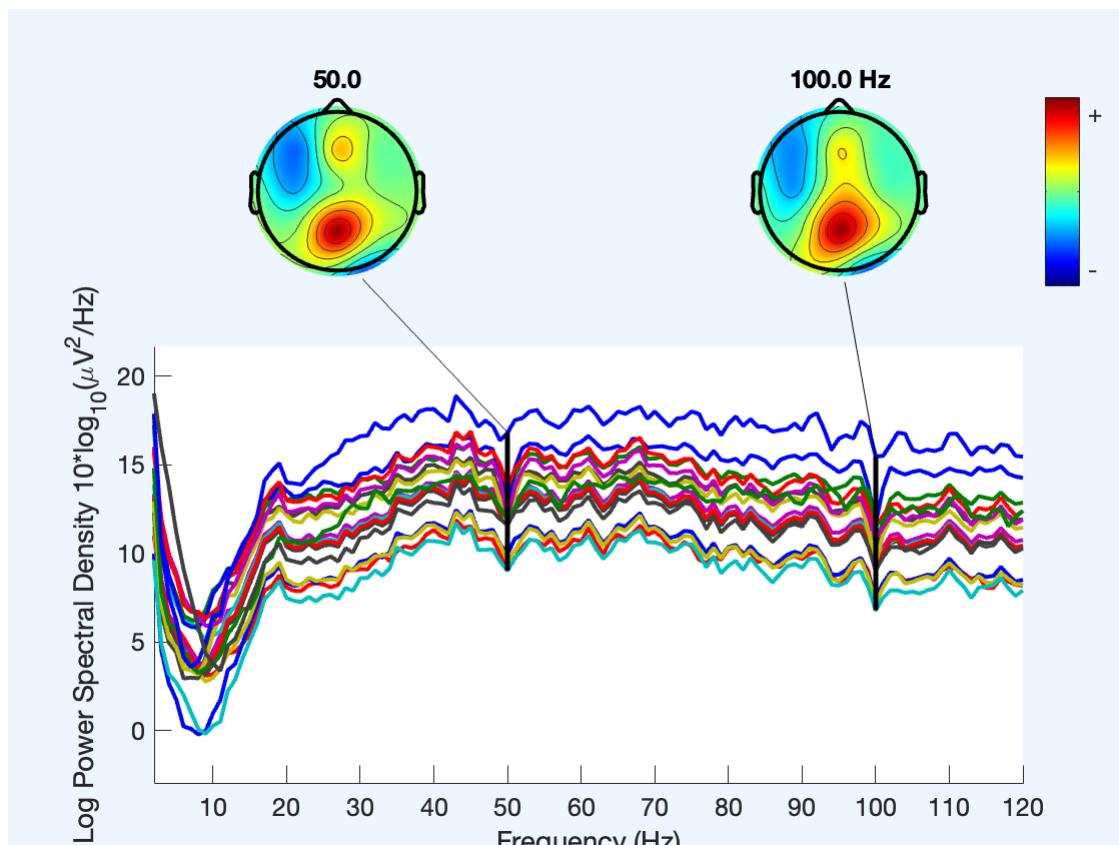
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A12 with filename: A12_3_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A13 for folder 1

pop_loadset(): loading file/nback_study_VR_EEG_data/A13/1/A13_1_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

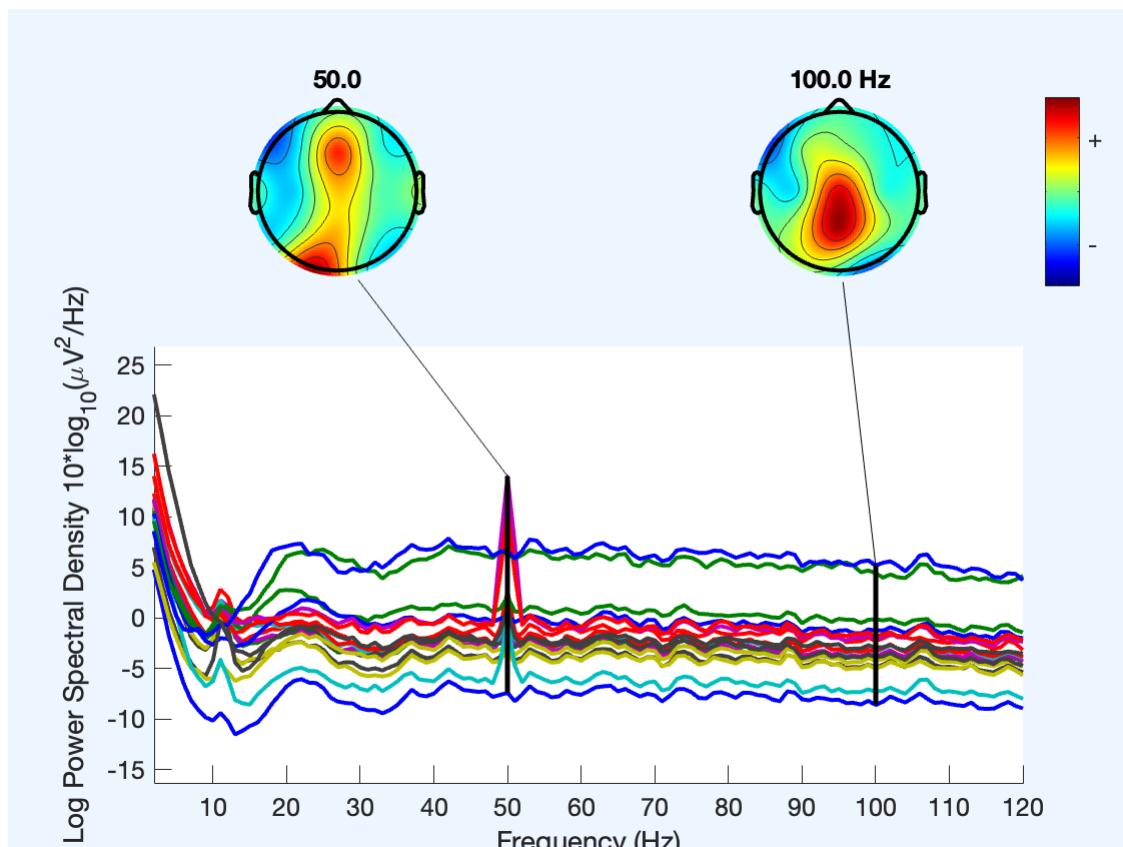
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

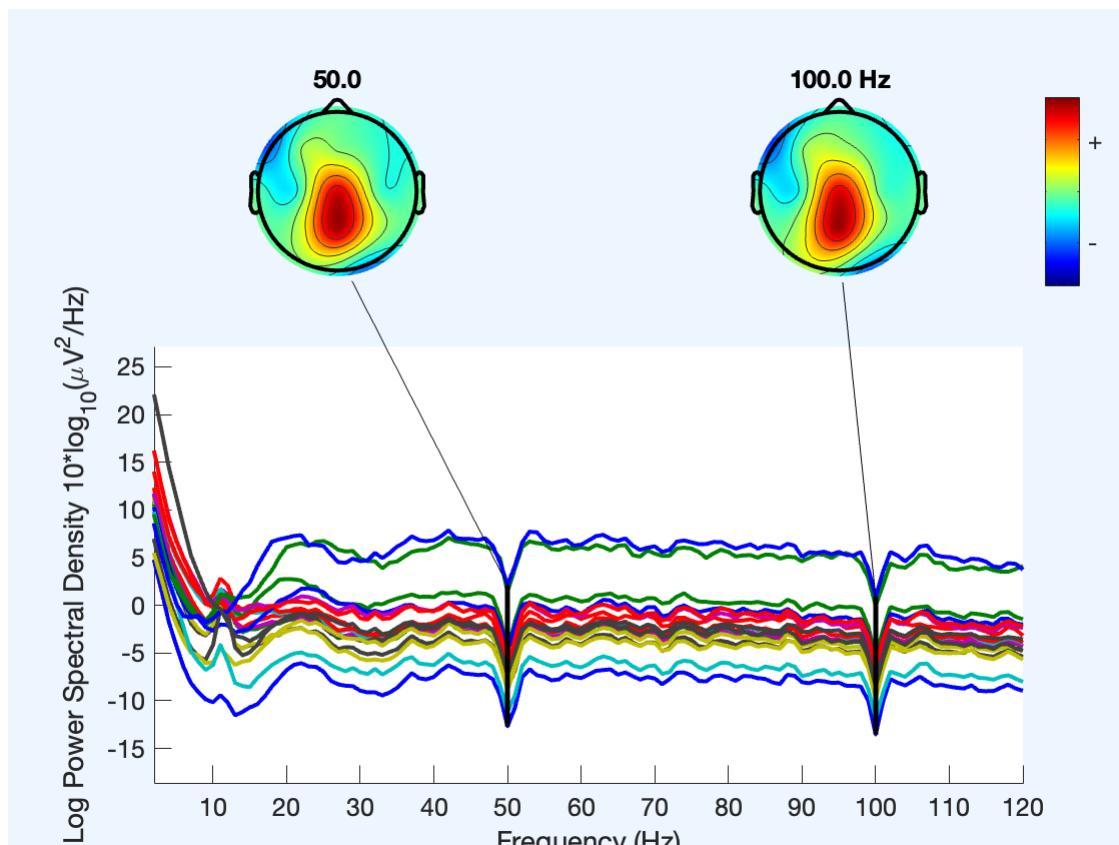
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A13 with filename: A13_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A13 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A13/2/A13_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

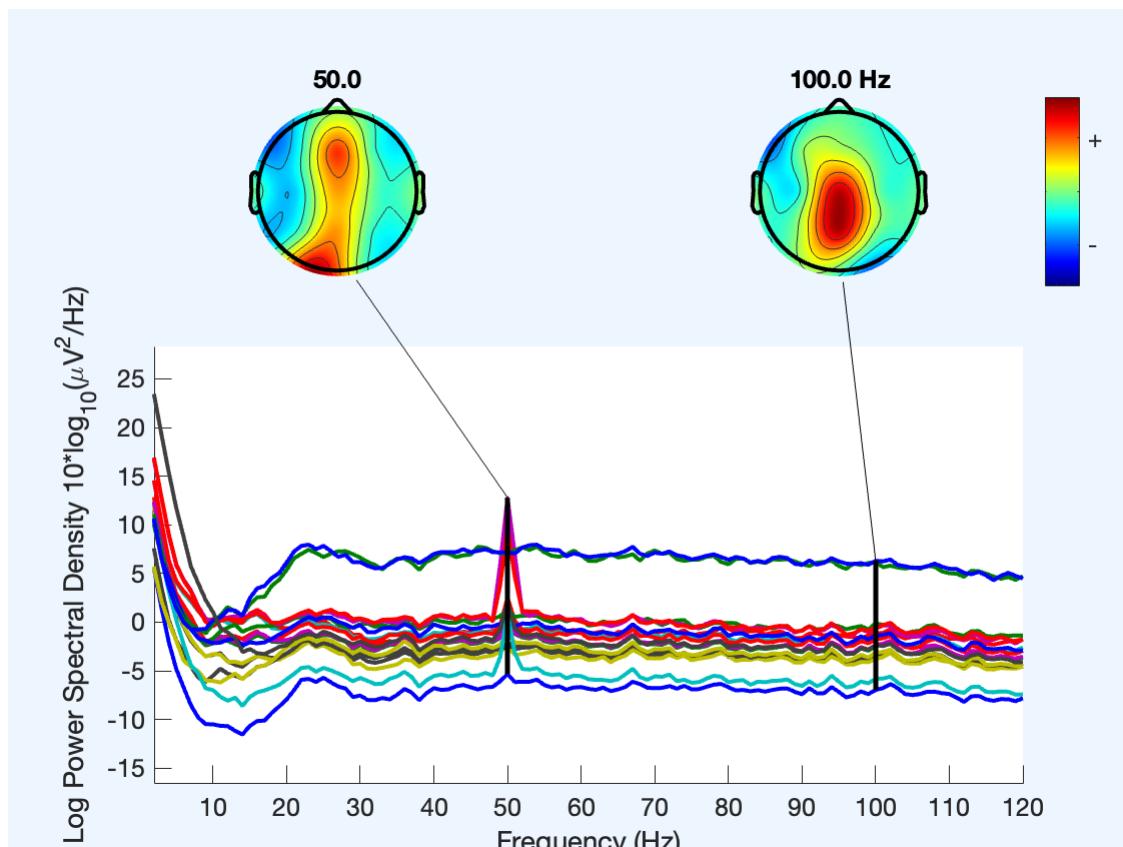
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

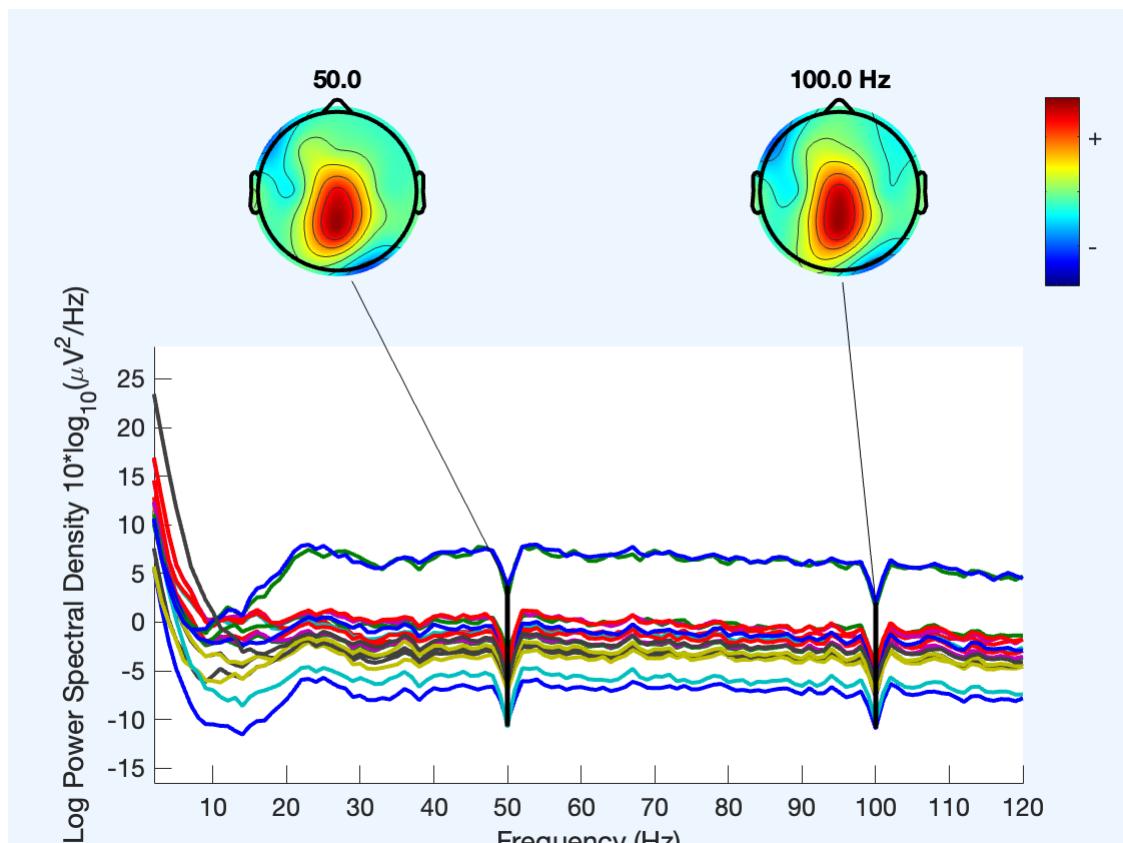
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000

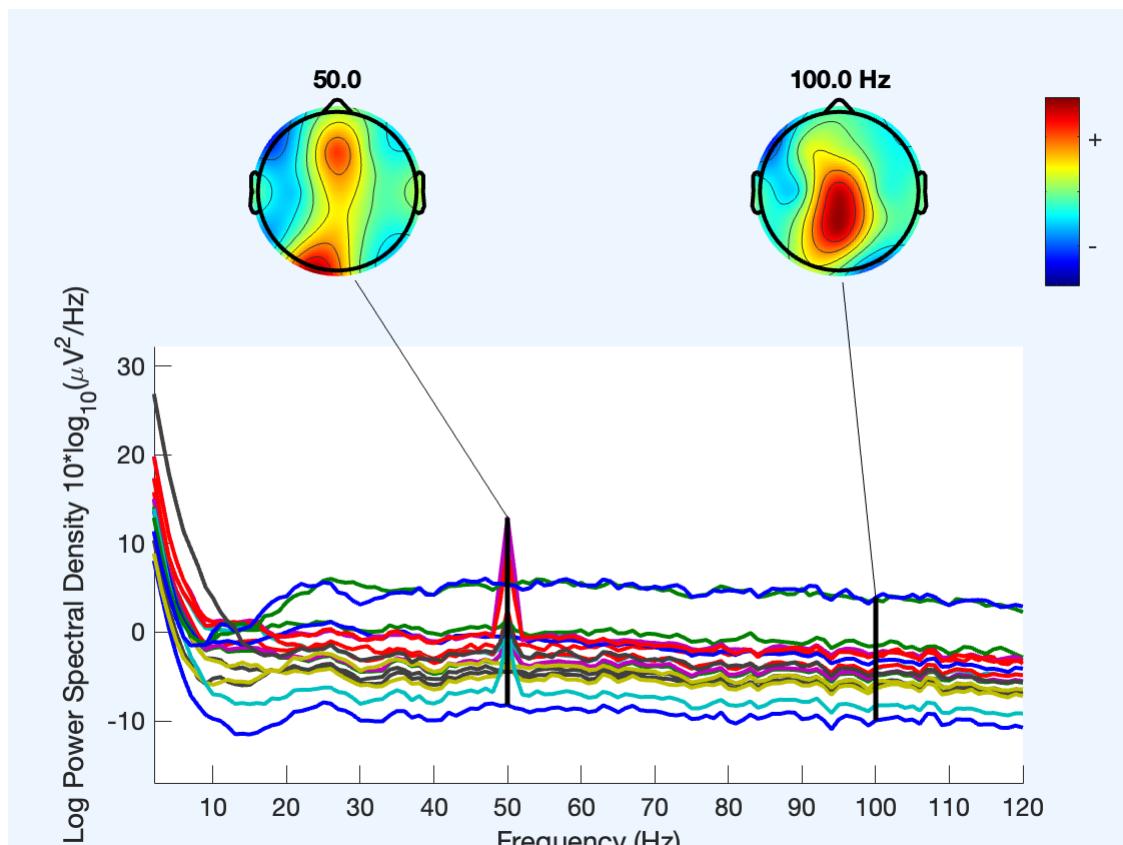
```



```

Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A13 with filename: A13_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A13 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A13/3/A13_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ...
Click on each trace for channel/component index

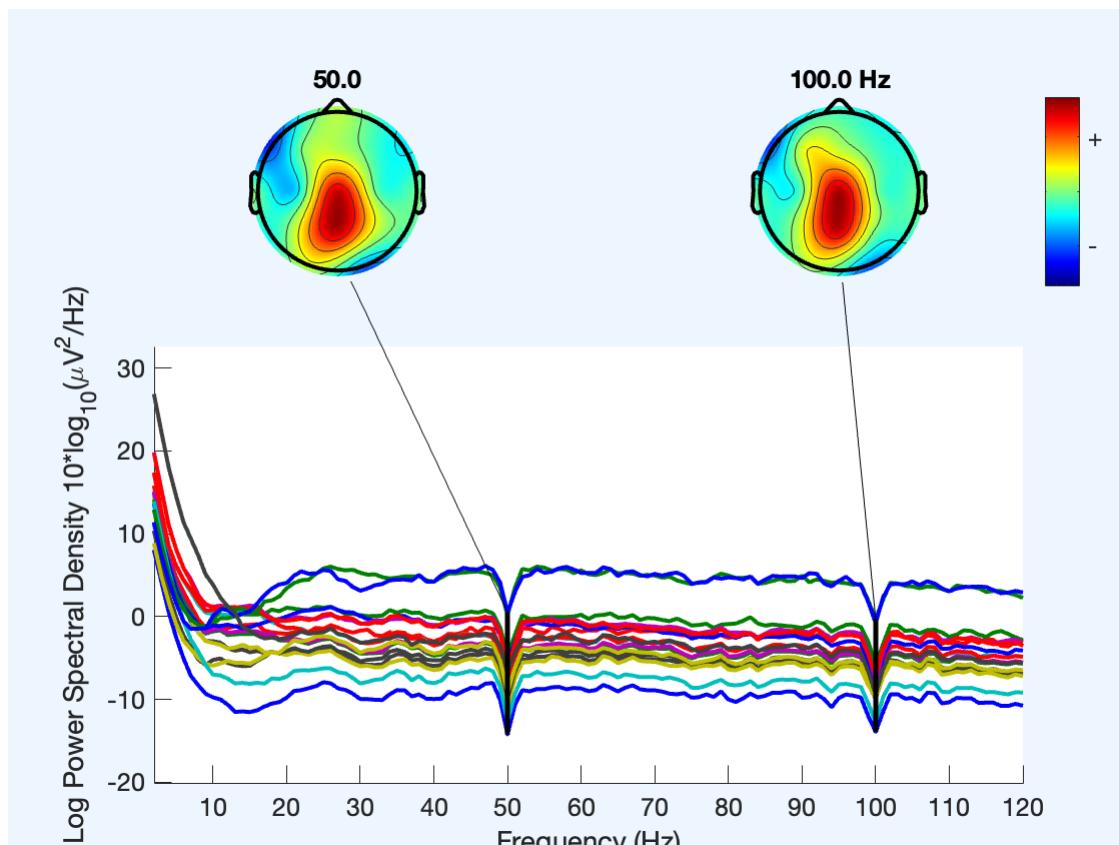
```



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

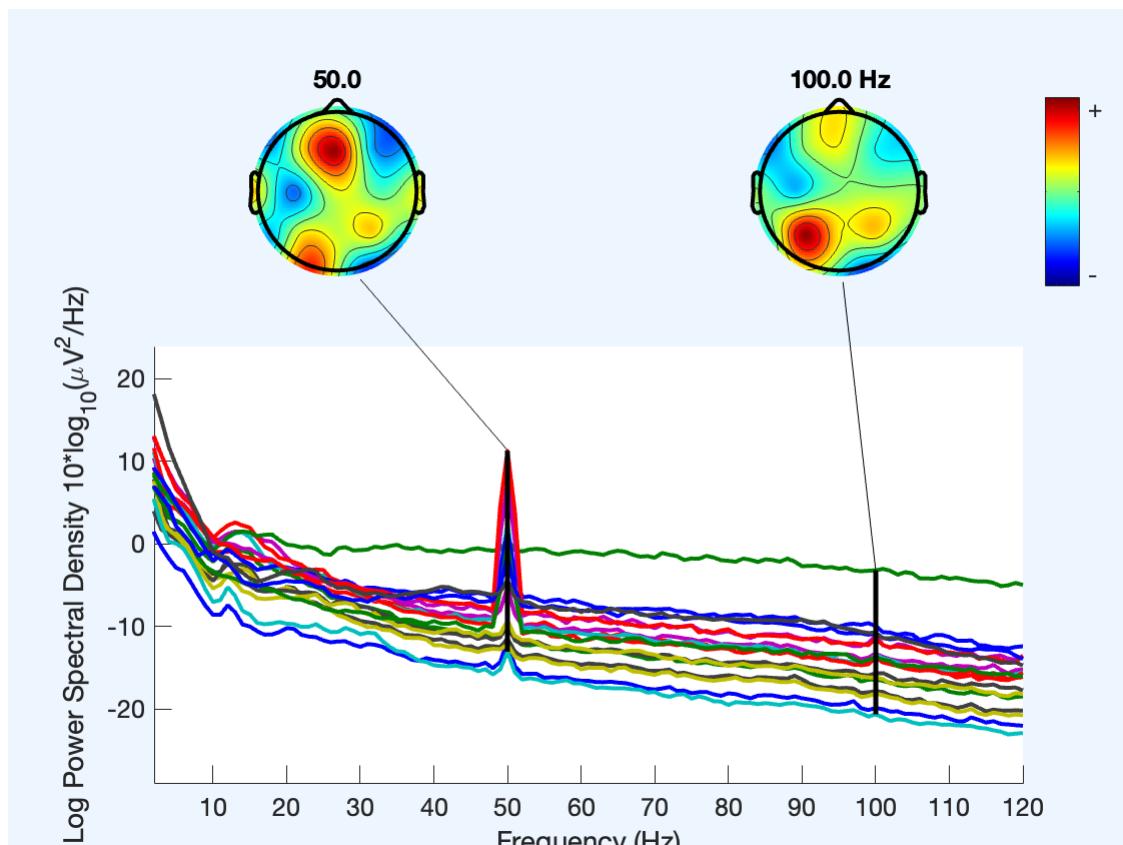
```



Saving data for A13 with filename: A13_3_upevent_mark_PrepocD1.set
 Saving dataset...

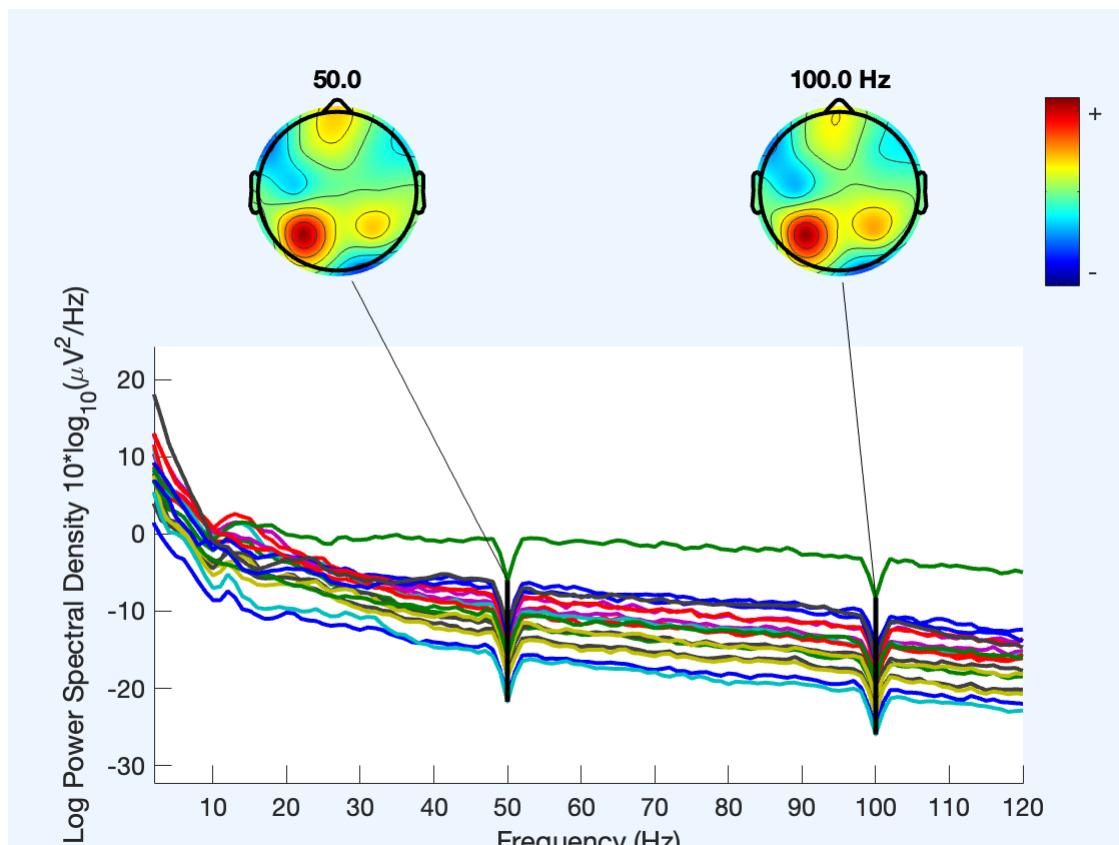
Processing subject: A14 for folder 1
 pop_loadset(): loading file/nback_study_VR_EEG_data/A14/1/A14_1_upevent_mark.set ...
 Re-referencing data
 pop_eegfiltnew() - performing 33001 point highpass filtering.
 pop_eegfiltnew() - transition band width: 0.05 Hz
 pop_eegfiltnew() - passband edge(s): 0.05 Hz
 pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
 pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
 firfilt(): |=====| 100%, ETE 00:00
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

 Plotting scalp distributions: ...
 Click on each trace for channel/component index
 Running cleanLineNoise (new version of cleanline)...



Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

 Plotting scalp distributions: ..
 Click on each trace for channel/component index
 resampling data 250.0000 Hz
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
 resampling event latencies...
 resampling finished



Saving data for A14 with filename: A14_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A14 for folder 2

pop_loadset(): loading file/nback_study_VR_EEG_data/A14/2/A14_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

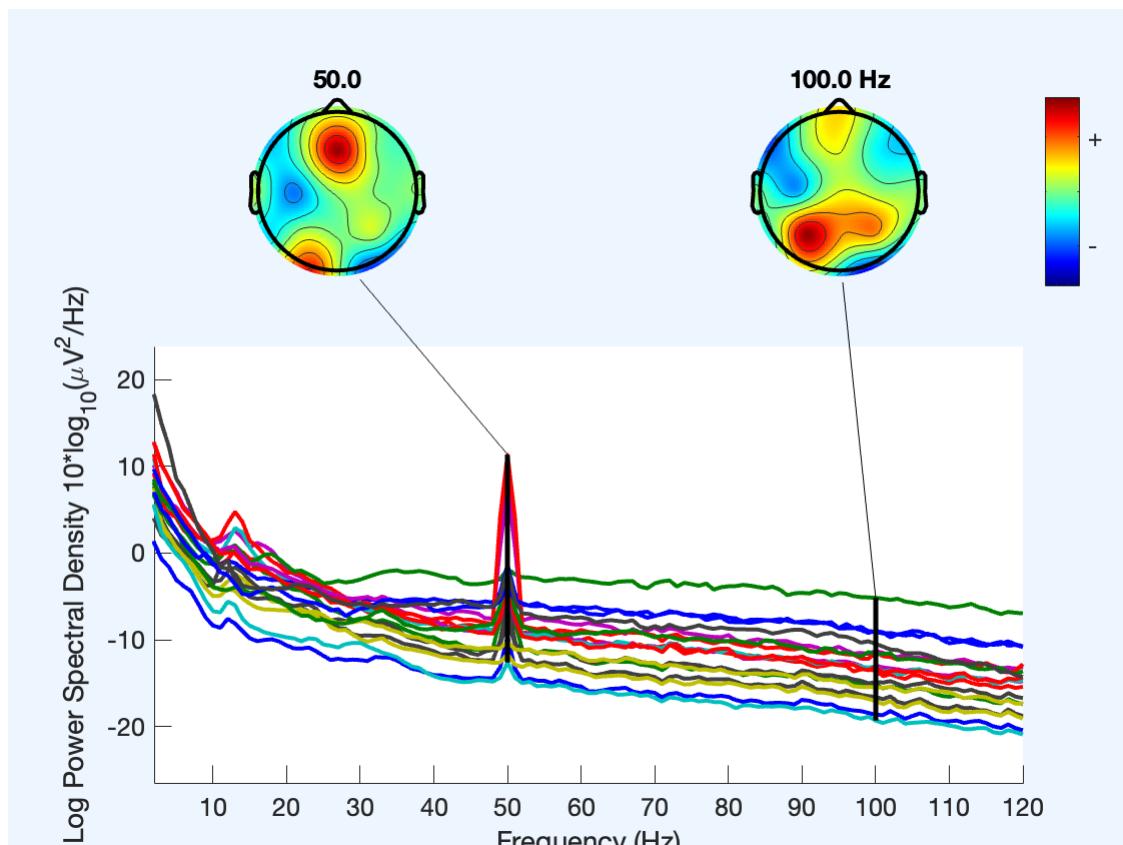
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

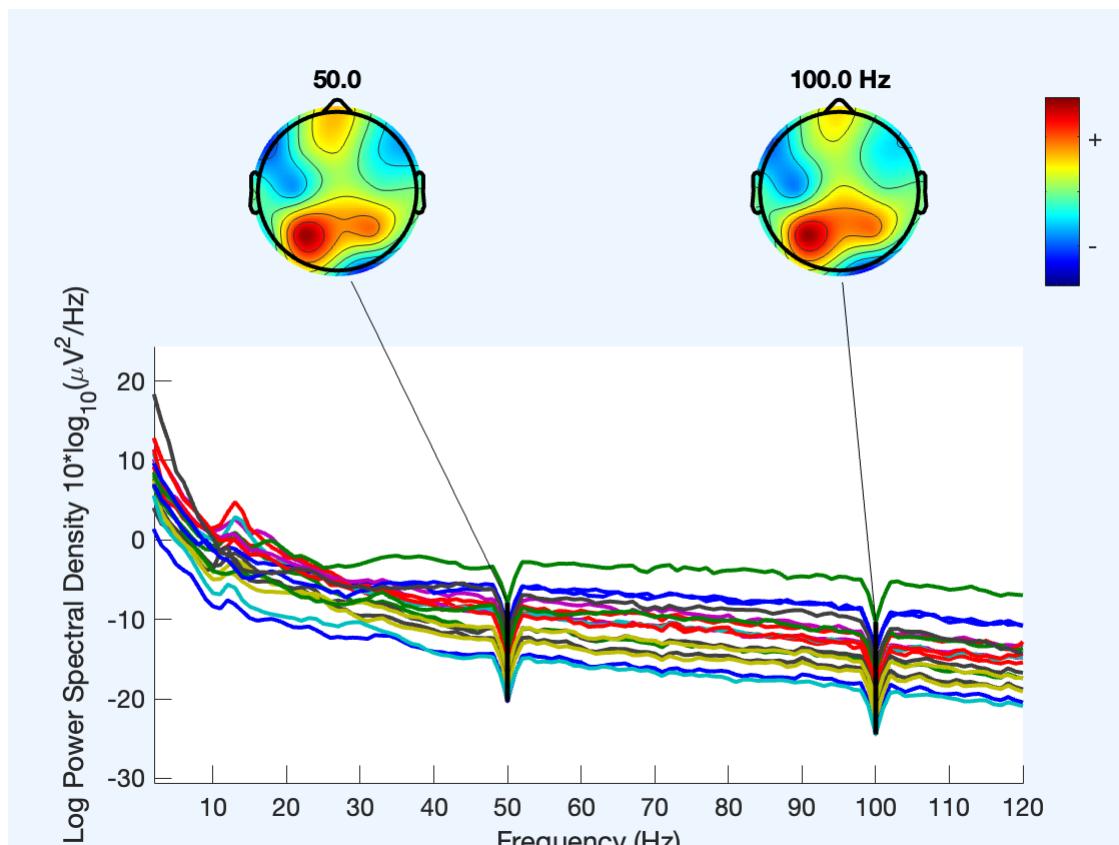
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

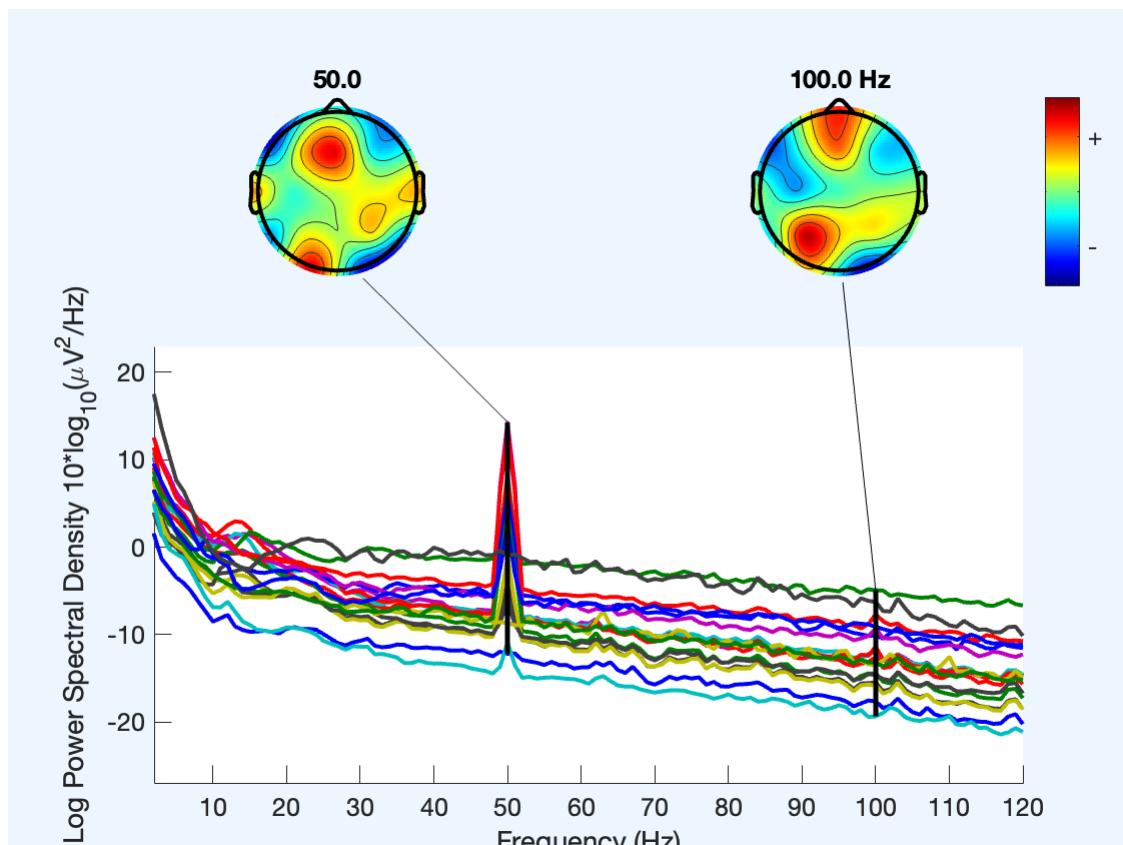
```



Saving data for A14 with filename: A14_2_upevent_mark_PrepocD1.set
 Saving dataset...

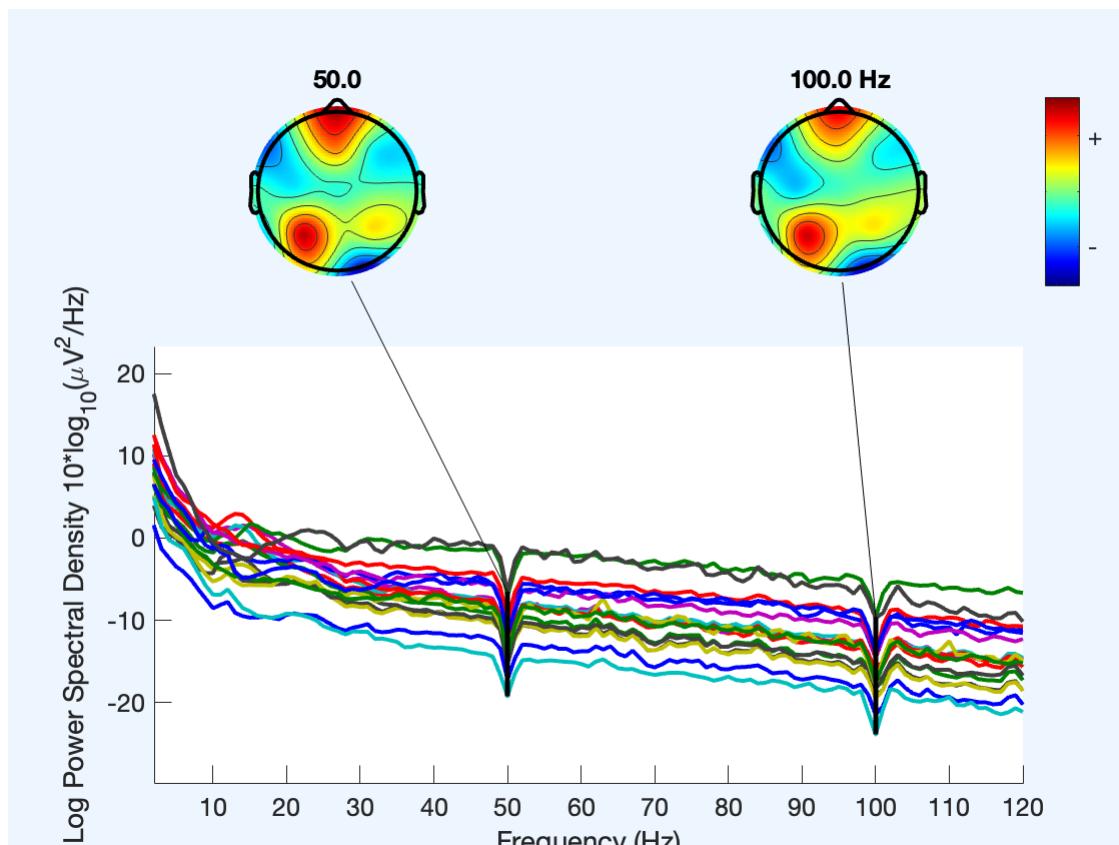
Processing subject: A14 for folder 3
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A14/3/A14_3_upevent_mark.set ...
 Re-referencing data
 pop_eegfiltnew() - performing 33001 point highpass filtering.
 pop_eegfiltnew() - transition band width: 0.05 Hz
 pop_eegfiltnew() - passband edge(s): 0.05 Hz
 pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
 pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
 firfilt(): |=====| 100%, ETE 00:00
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

 Plotting scalp distributions: ...
 Click on each trace for channel/component index



Running cleanLineNoise (new version of cleanline)...
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

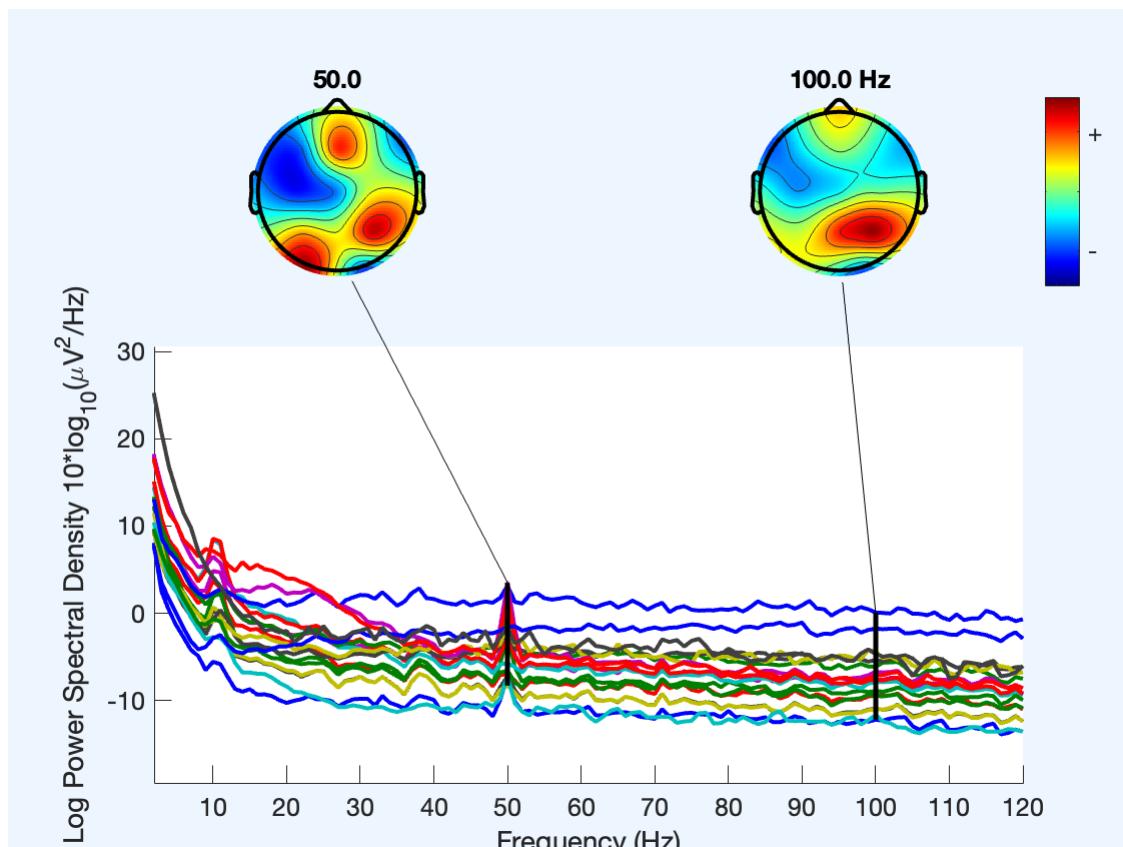
 Plotting scalp distributions: ..
 Click on each trace for channel/component index
 resampling data 250.0000 Hz
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
 resampling event latencies...
 resampling finished



Saving data for A14 with filename: A14_3_upevent_mark_PrepocD1.set
 Saving dataset...

Processing subject: A15 for folder 1
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/1/A15_1_upevent_mark.set ...
 Re-referencing data
 pop_eegfiltnew() - performing 33001 point highpass filtering.
 pop_eegfiltnew() - transition band width: 0.05 Hz
 pop_eegfiltnew() - passband edge(s): 0.05 Hz
 pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
 pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
 firfilt(): |=====| 100%, ETE 00:00
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

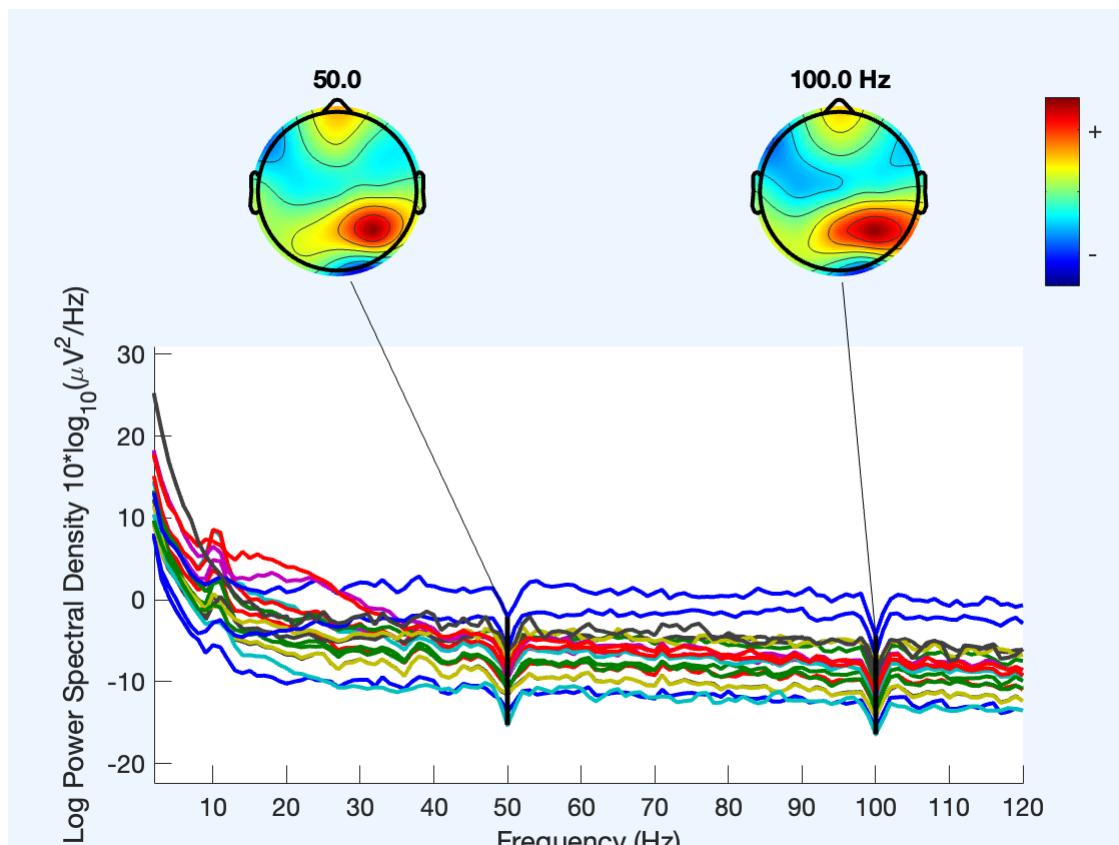
 Plotting scalp distributions: ...
 Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A15 with filename: A15_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A15 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/2/A15_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

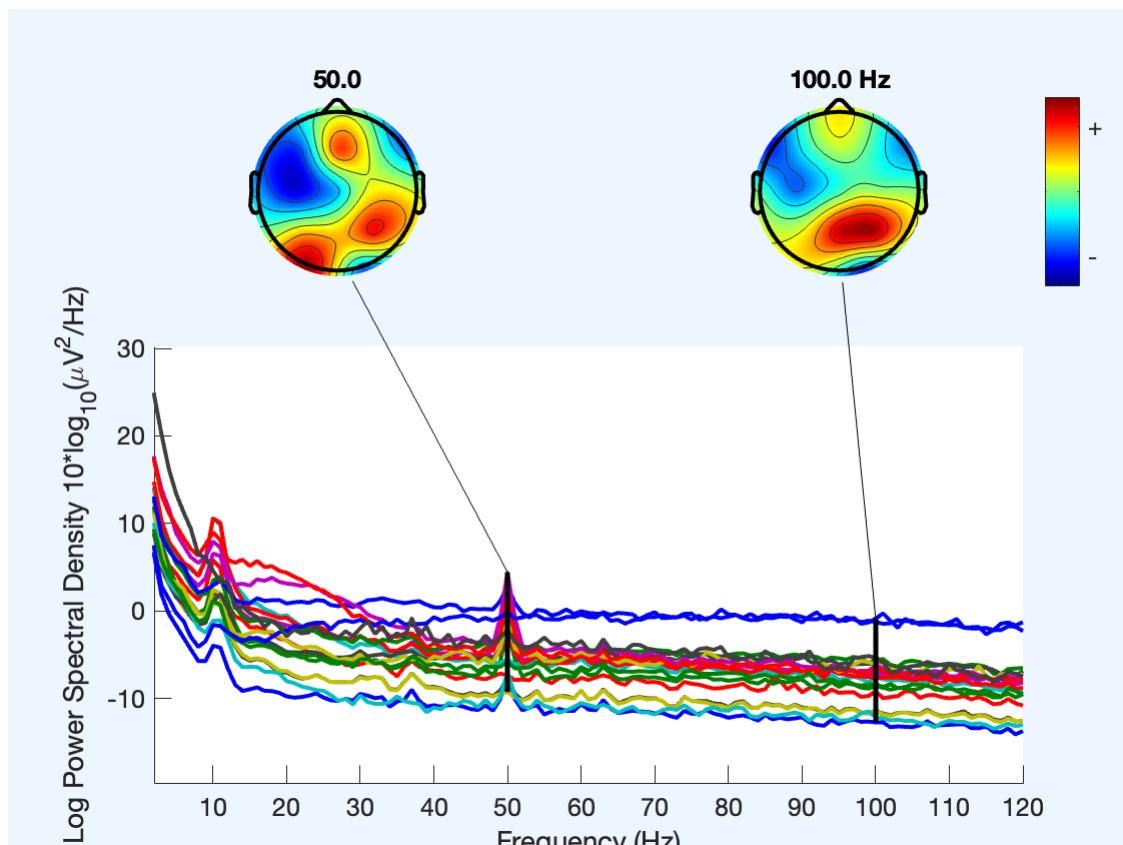
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

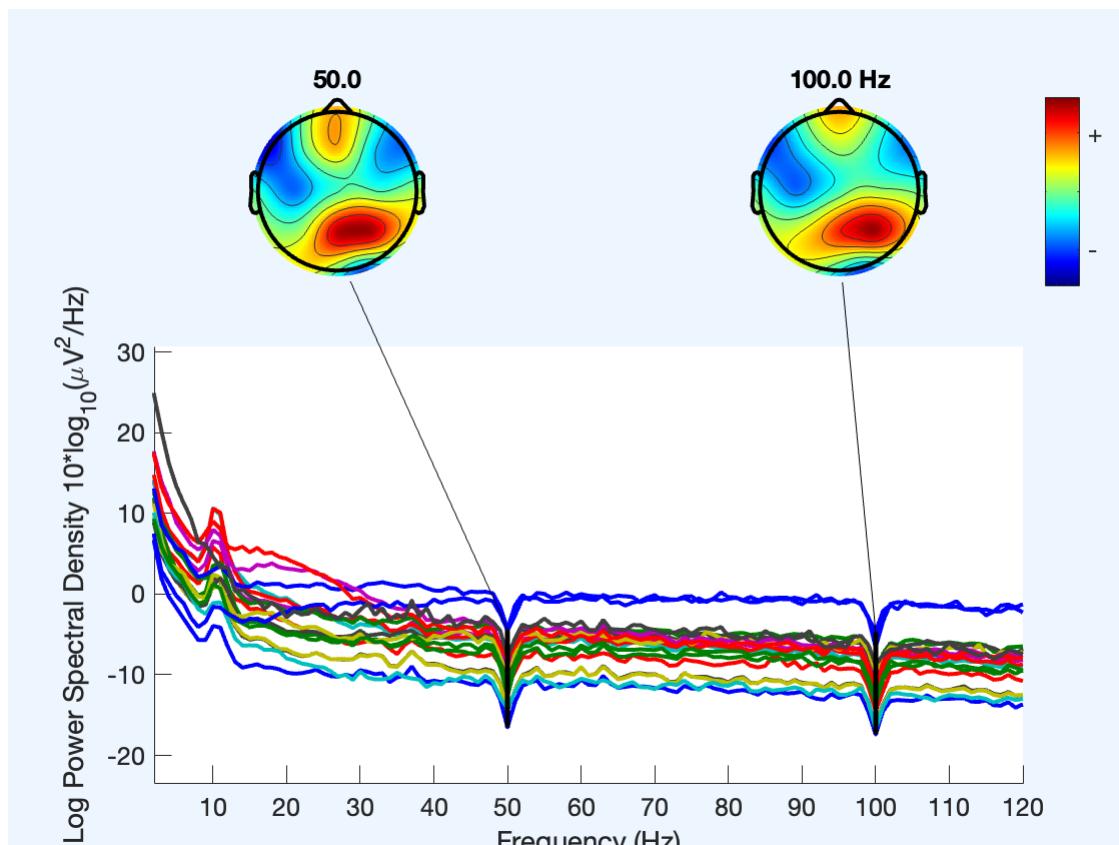
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A15 with filename: A15_2_upevent_mark_PrepocD1.set
 Saving dataset...

Processing subject: A15 for folder 3

pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/3/A15_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

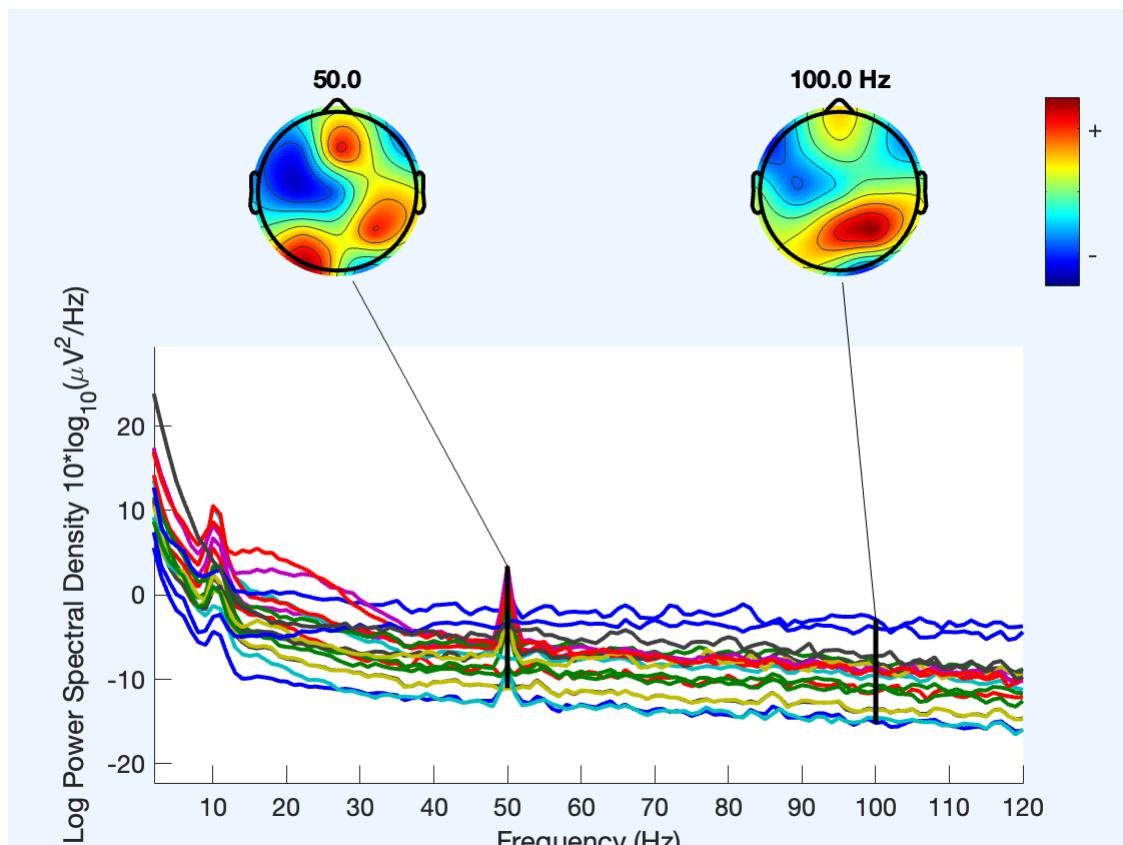
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

Click on each trace for channel/component index



Running cleanLineNoise (new version of cleanline)...

Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....
Plotting scalp distributions: ..

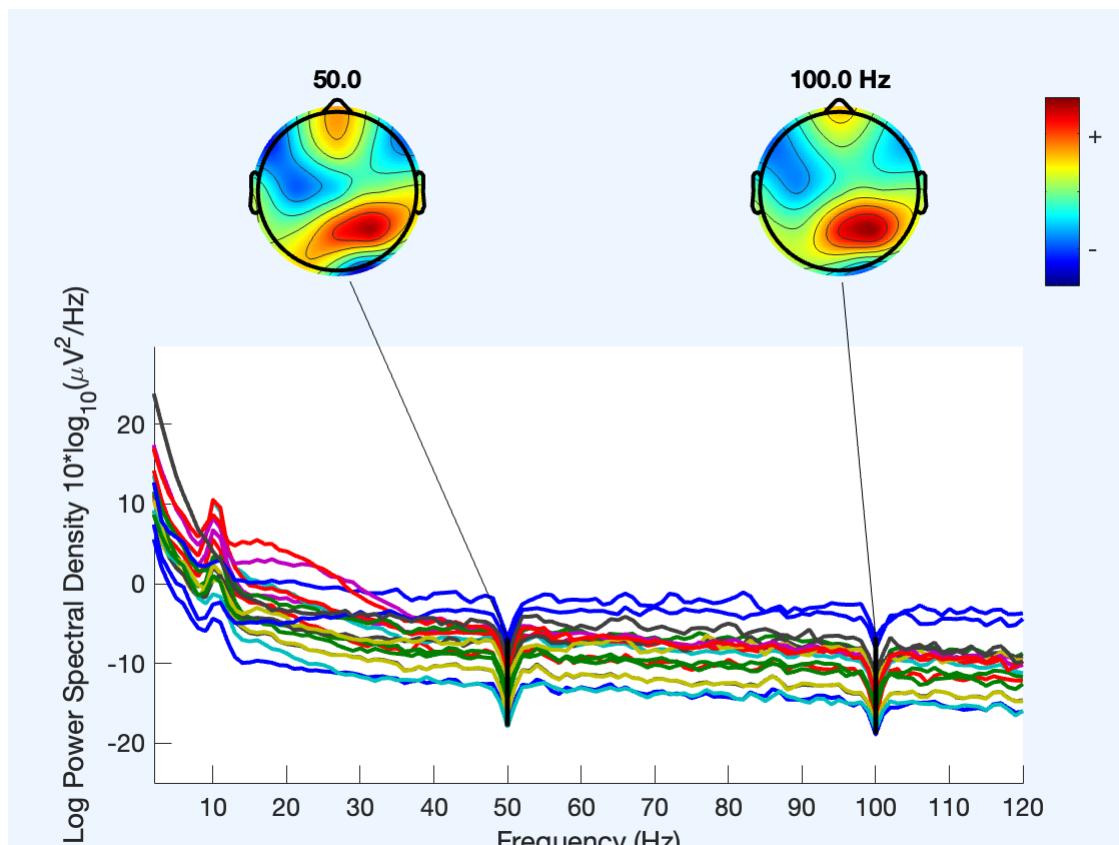
Click on each trace for channel/component index

resampling data 250.0000 Hz

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

resampling event latencies...

resampling finished



Saving data for A15 with filename: A15_3_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A16 for folder 1

pop_loadset(): loading file/nback_study_VR_EEG_data/A16/1/A16_1_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

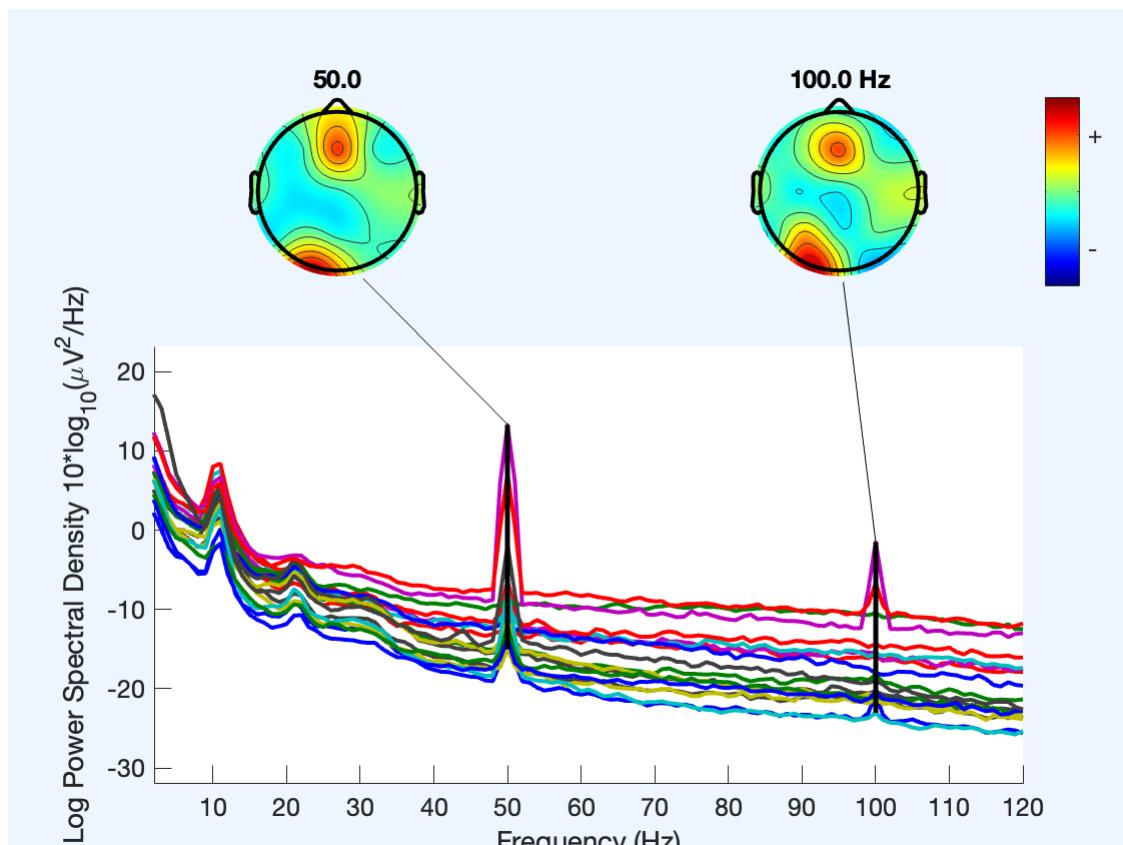
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

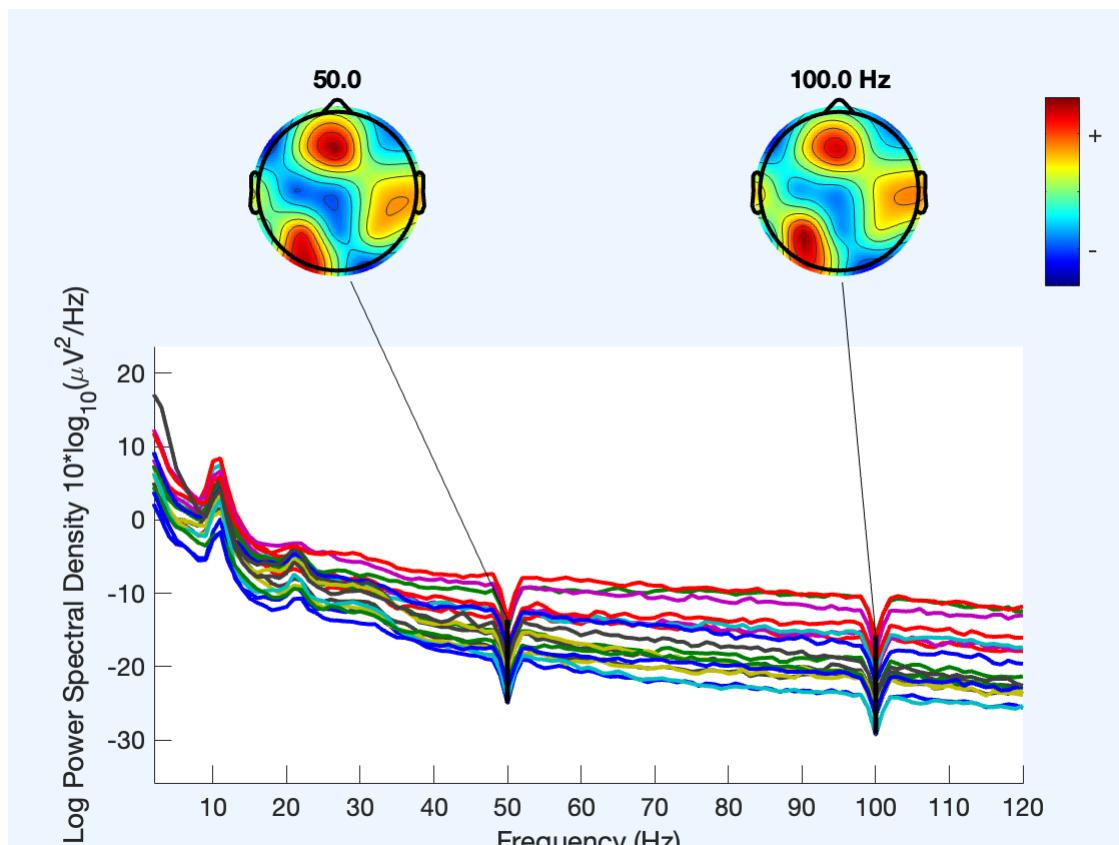
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A16 with filename: A16_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A16 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A16/2/A16_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

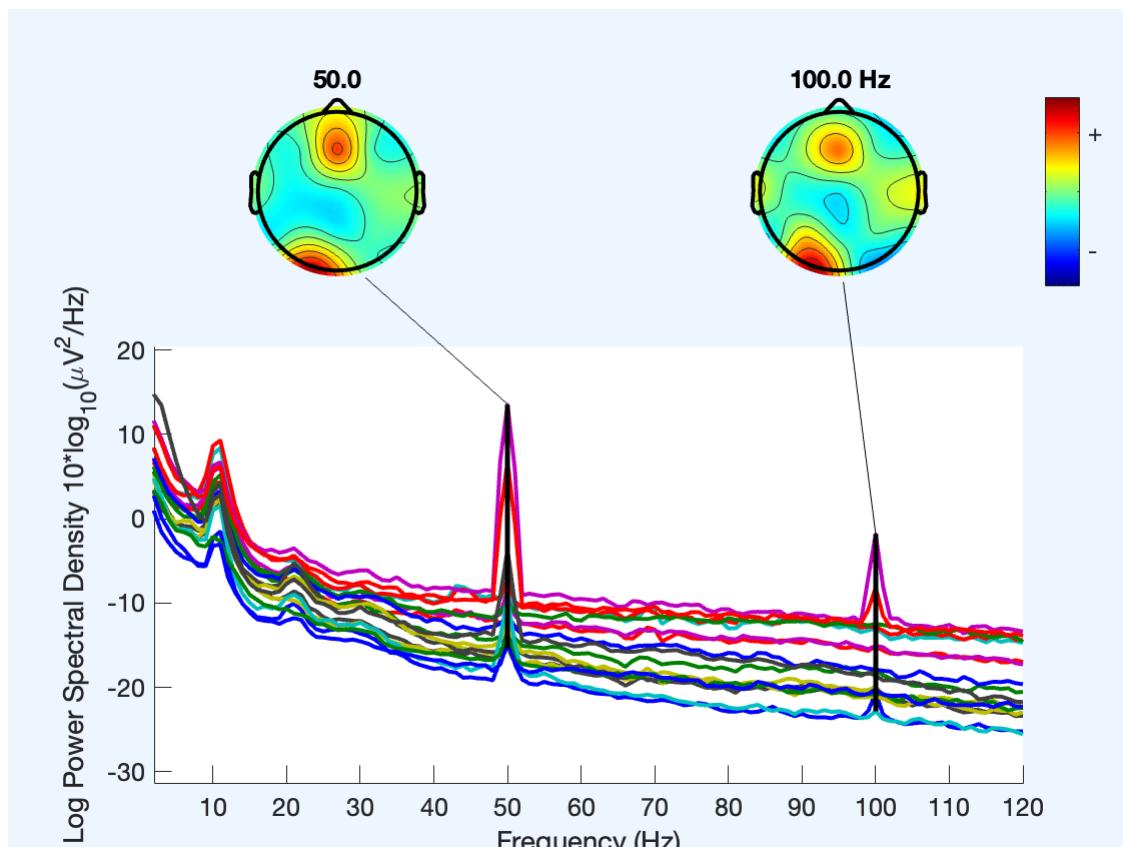
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

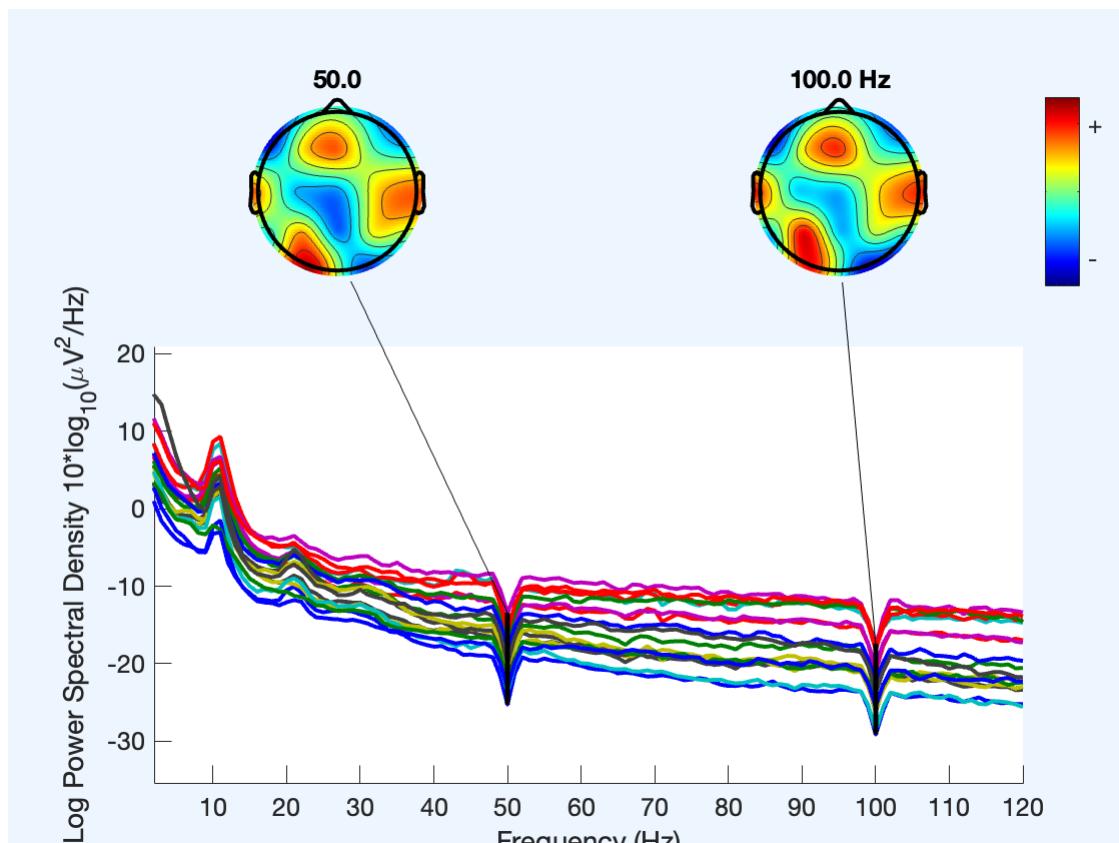
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index

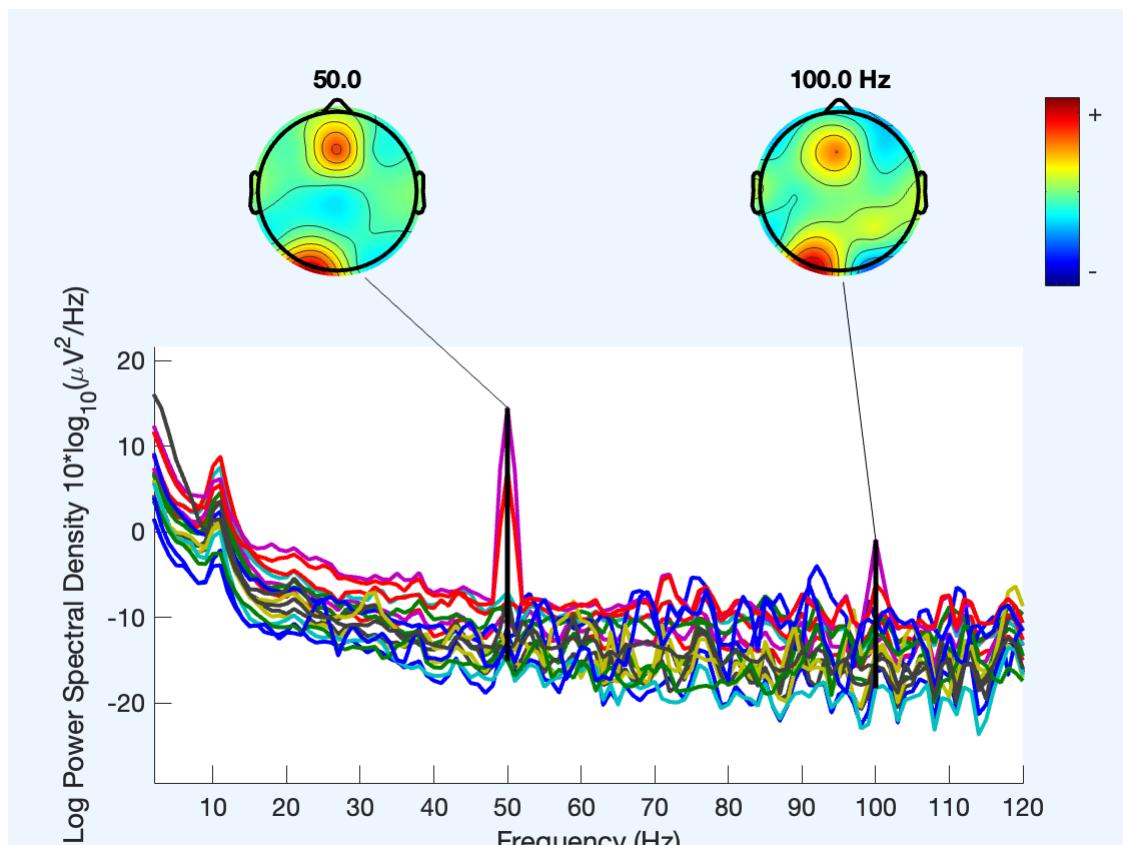
```



```

resampling data 250.000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A16 with filename: A16_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A16 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A16/3/A16_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ...
Click on each trace for channel/component index

```



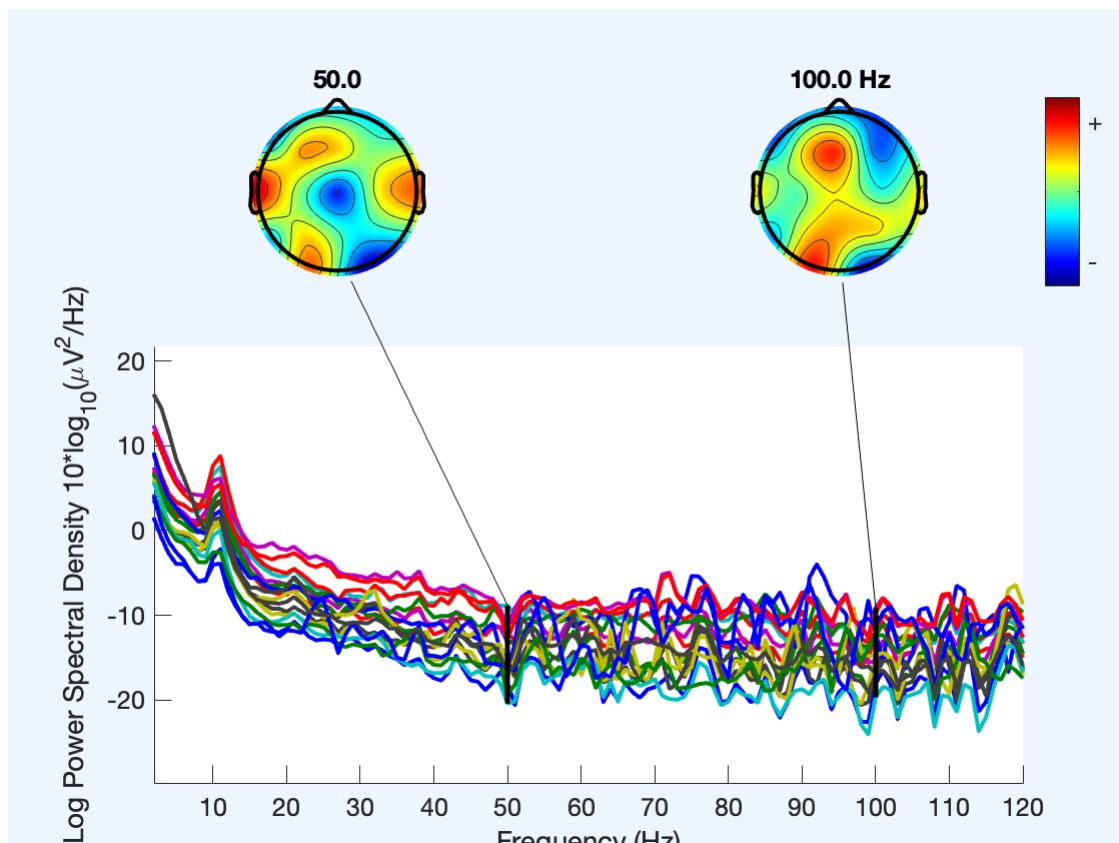
Running cleanLineNoise (new version of cleanline)...

Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....
Plotting scalp distributions: ..

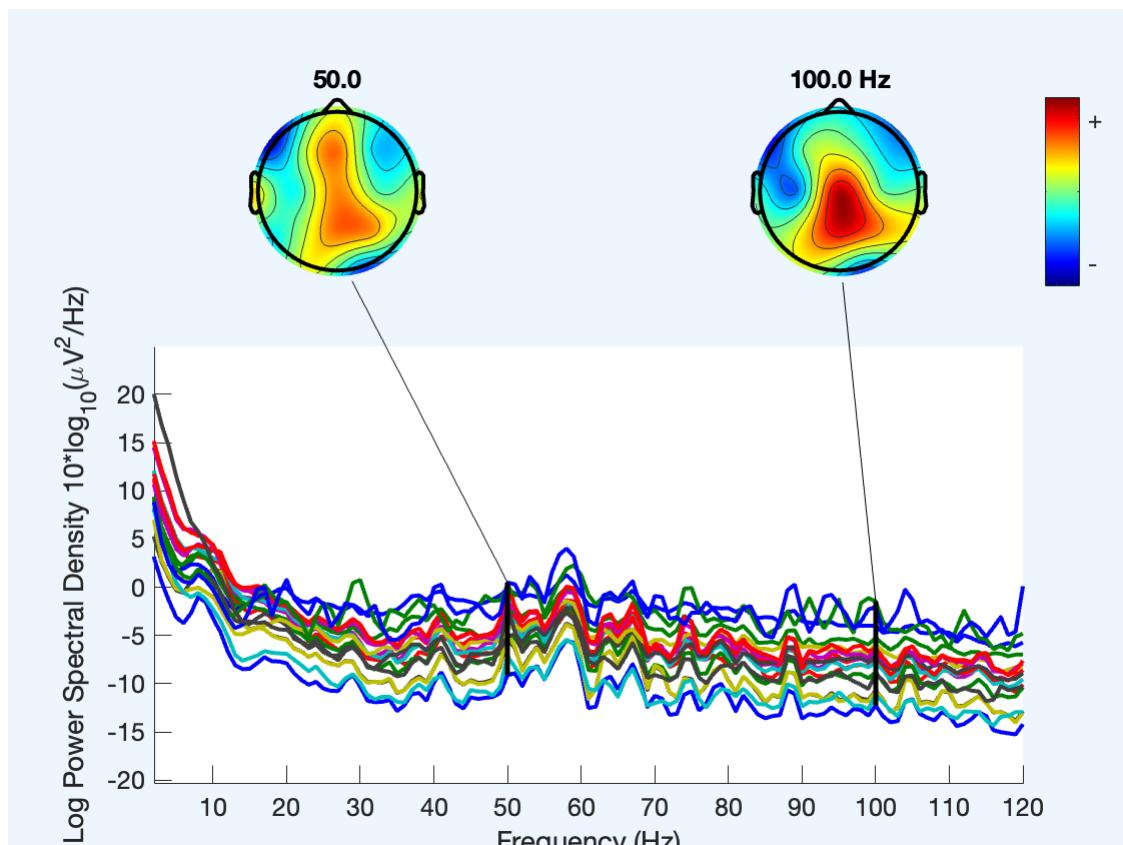
Click on each trace for channel/component index



```

resampling data 250.000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A16 with filename: A16_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A17 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A17/1/A17_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ...
Click on each trace for channel/component index

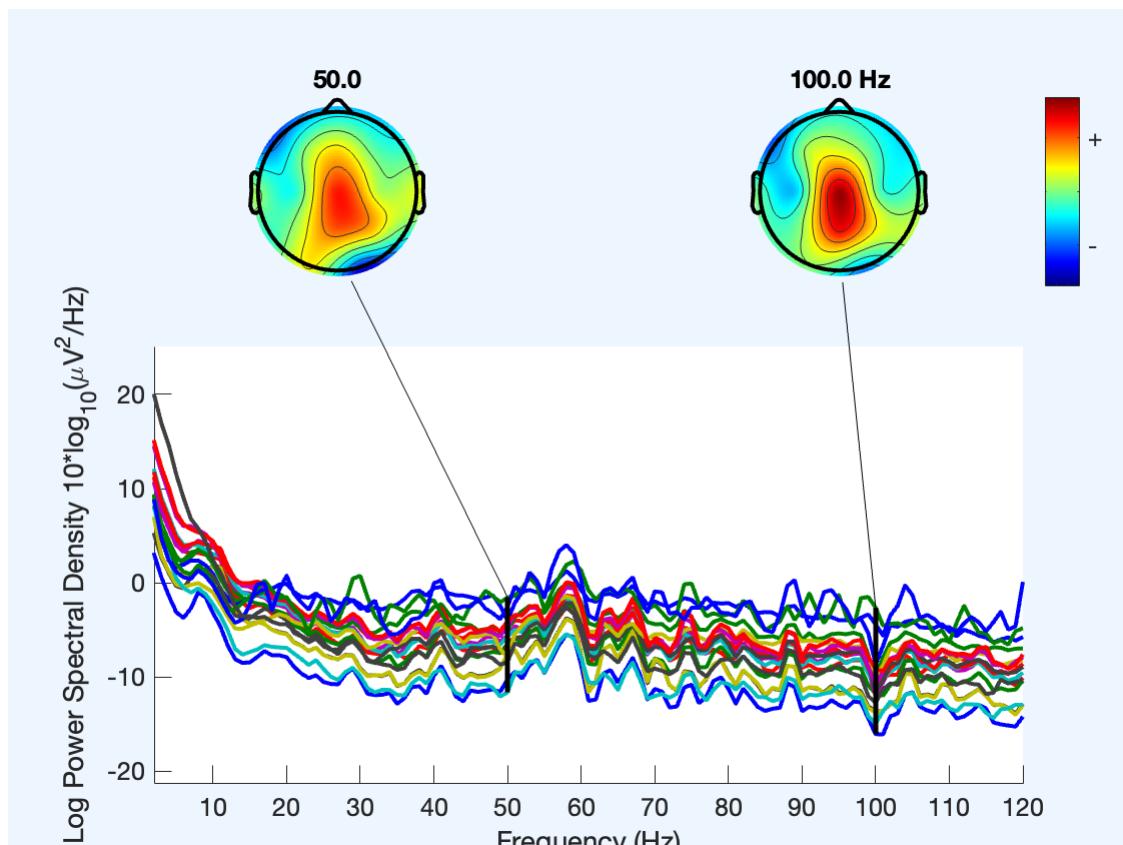
```



```

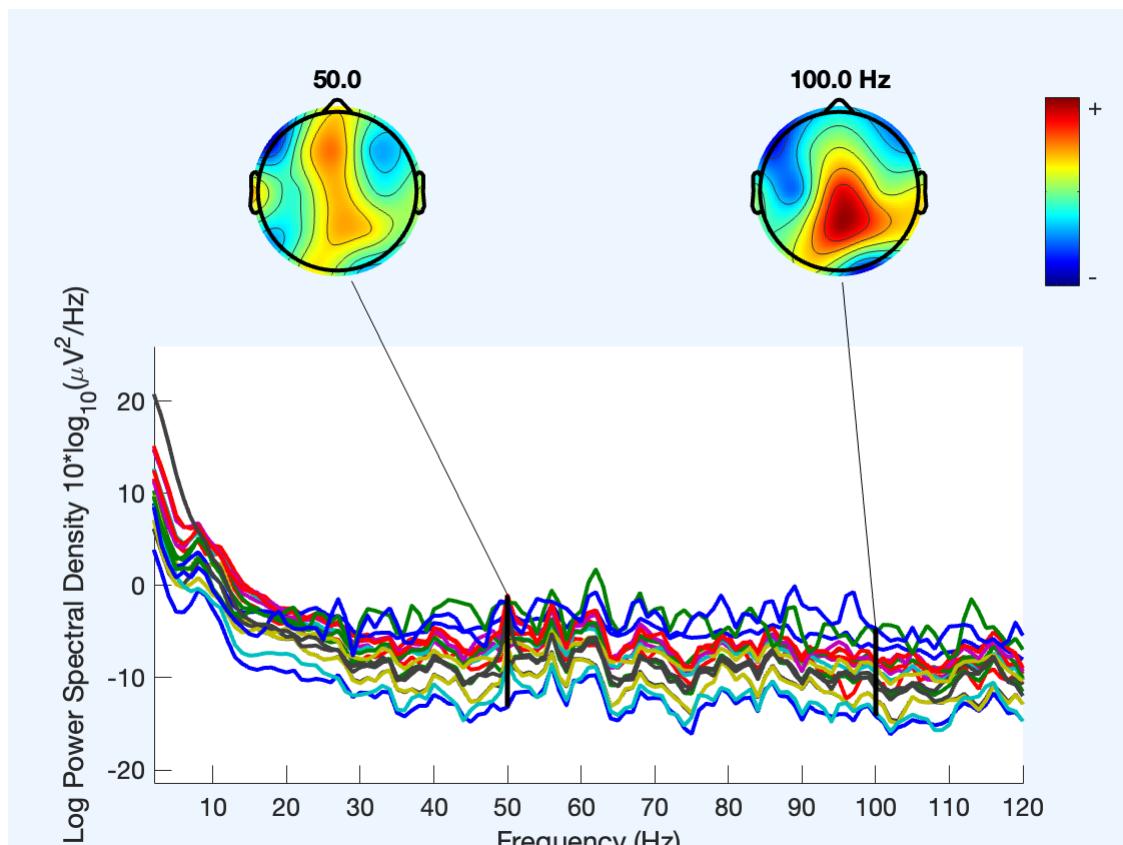
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A17 with filename: A17_1_upevent_mark_PrepocD1.set
 Saving dataset...
 Processing subject: A17 for folder 2
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A17/2/A17_2_upevent_mark.set ...
 Re-referencing data
 pop_eegfiltnew() - performing 33001 point highpass filtering.
 pop_eegfiltnew() - transition band width: 0.05 Hz
 pop_eegfiltnew() - passband edge(s): 0.05 Hz
 pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
 pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
 firfilt(): |=====| 100%, ETE 00:00
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

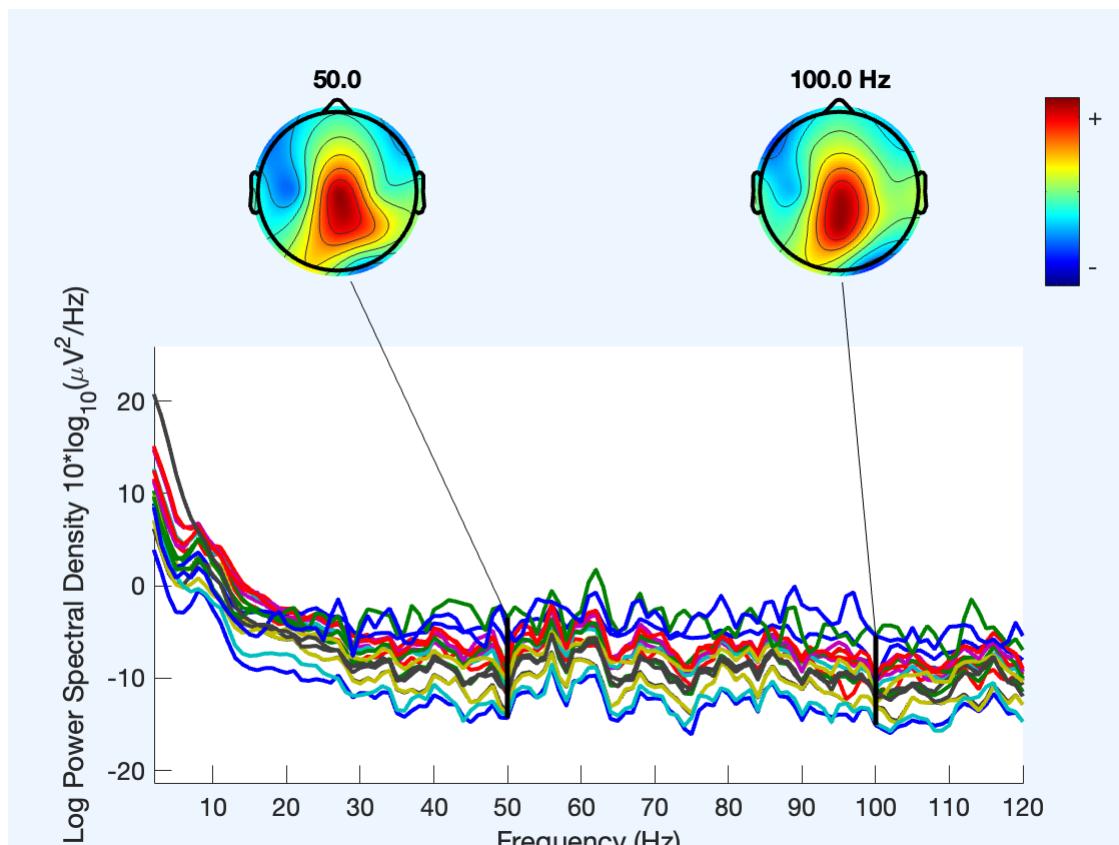
 Plotting scalp distributions: ...
 Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A17 with filename: A17_2_upevent_mark_PrepocD1.set
 Saving dataset...

Processing subject: A17 for folder 3

pop_loadset(): loading file/nback_study_VR_EEG_data/A17/3/A17_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

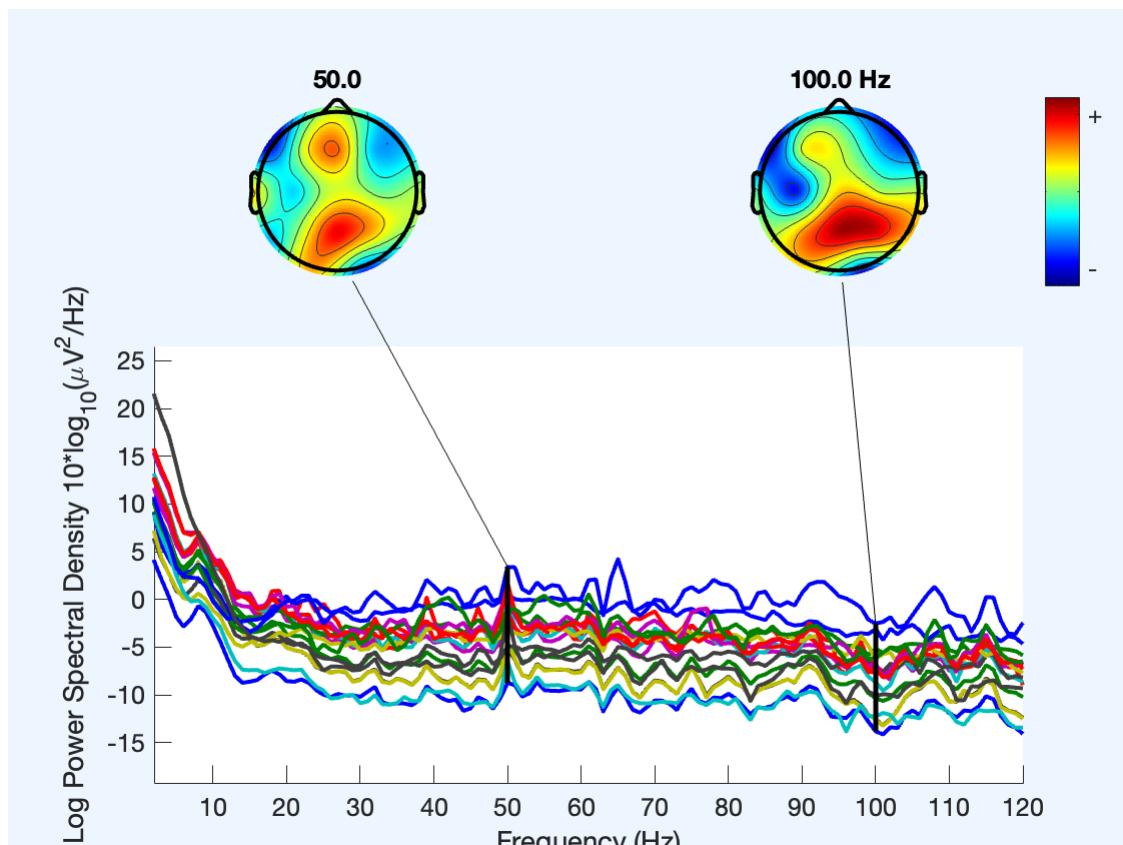
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

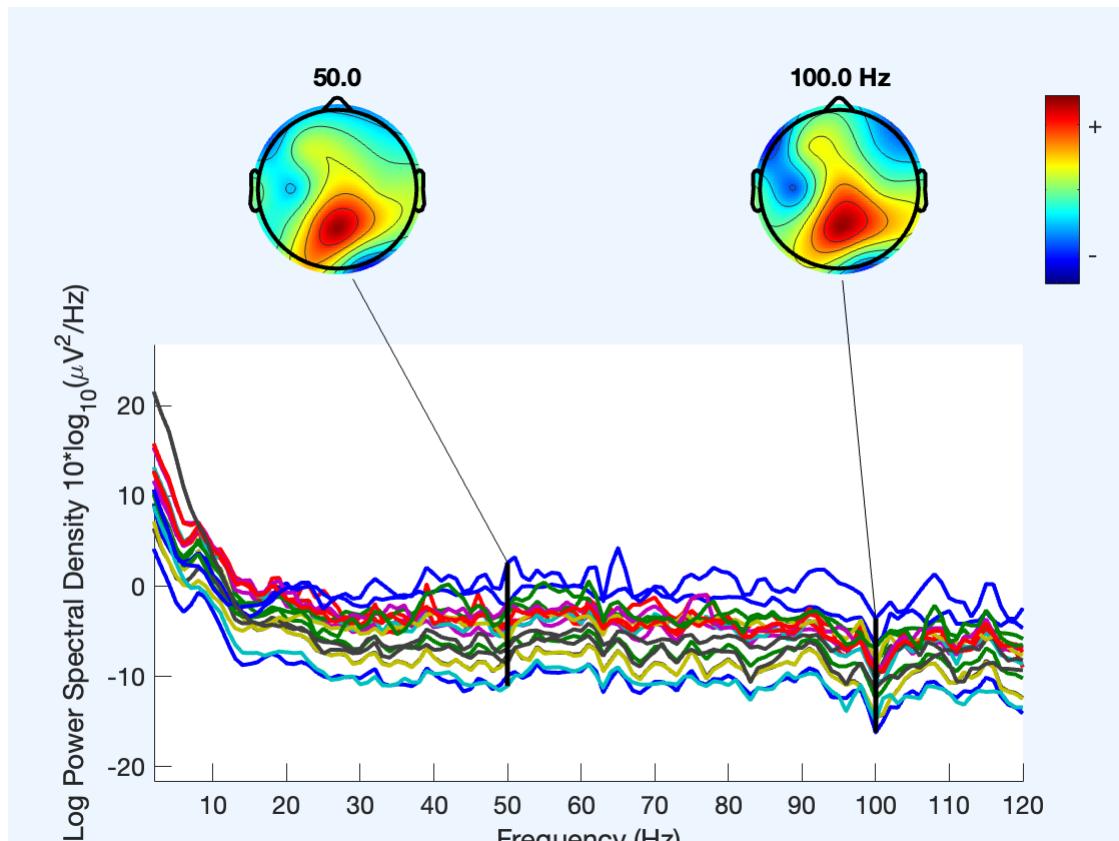
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index

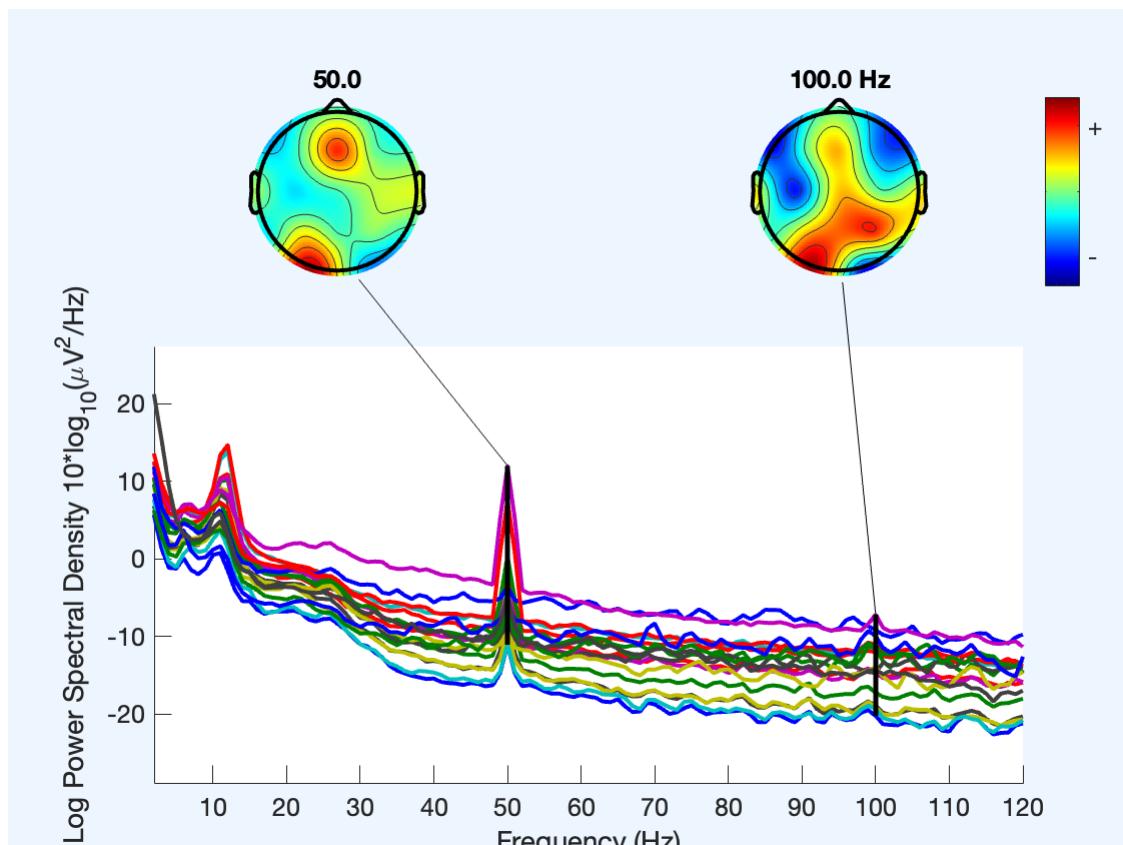
```



```

resampling data 250.000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A17 with filename: A17_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A18 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/1/A18_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ...
Click on each trace for channel/component index

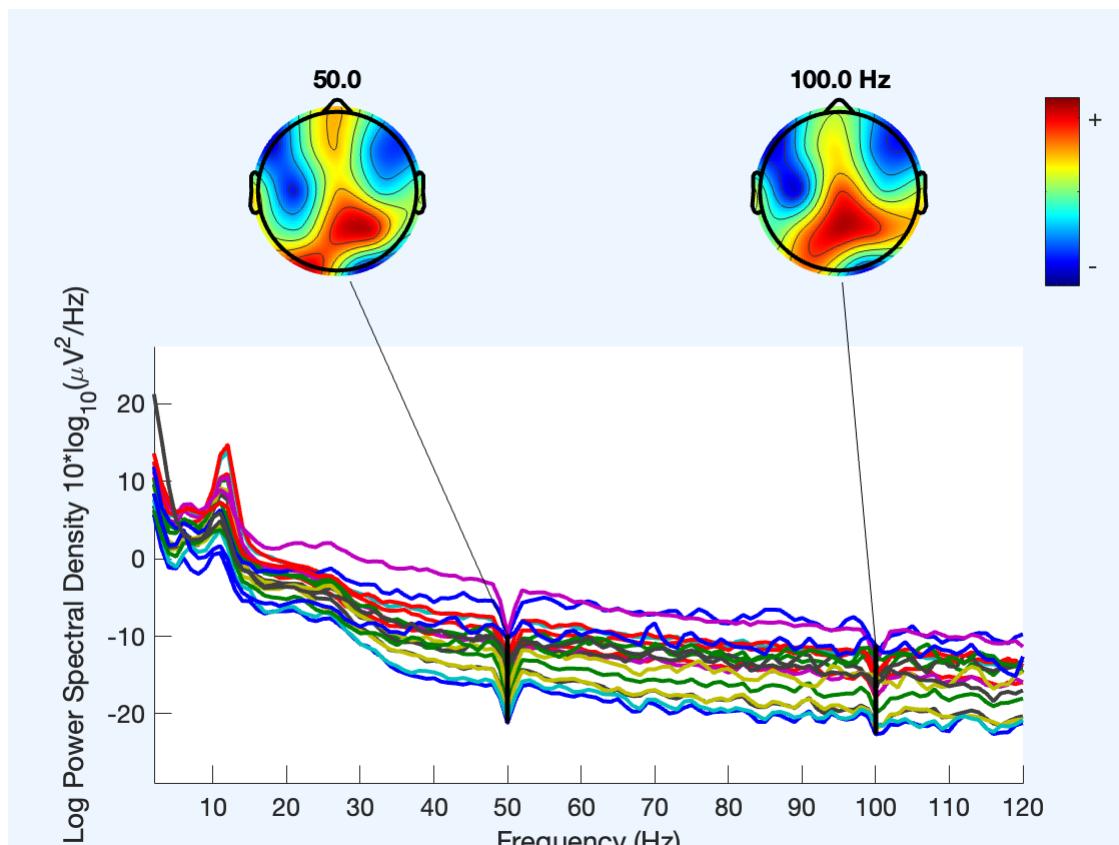
```



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A18 with filename: A18_1_upevent_mark_PrepocD1.set
 Saving dataset...

Processing subject: A18 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/2/A18_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

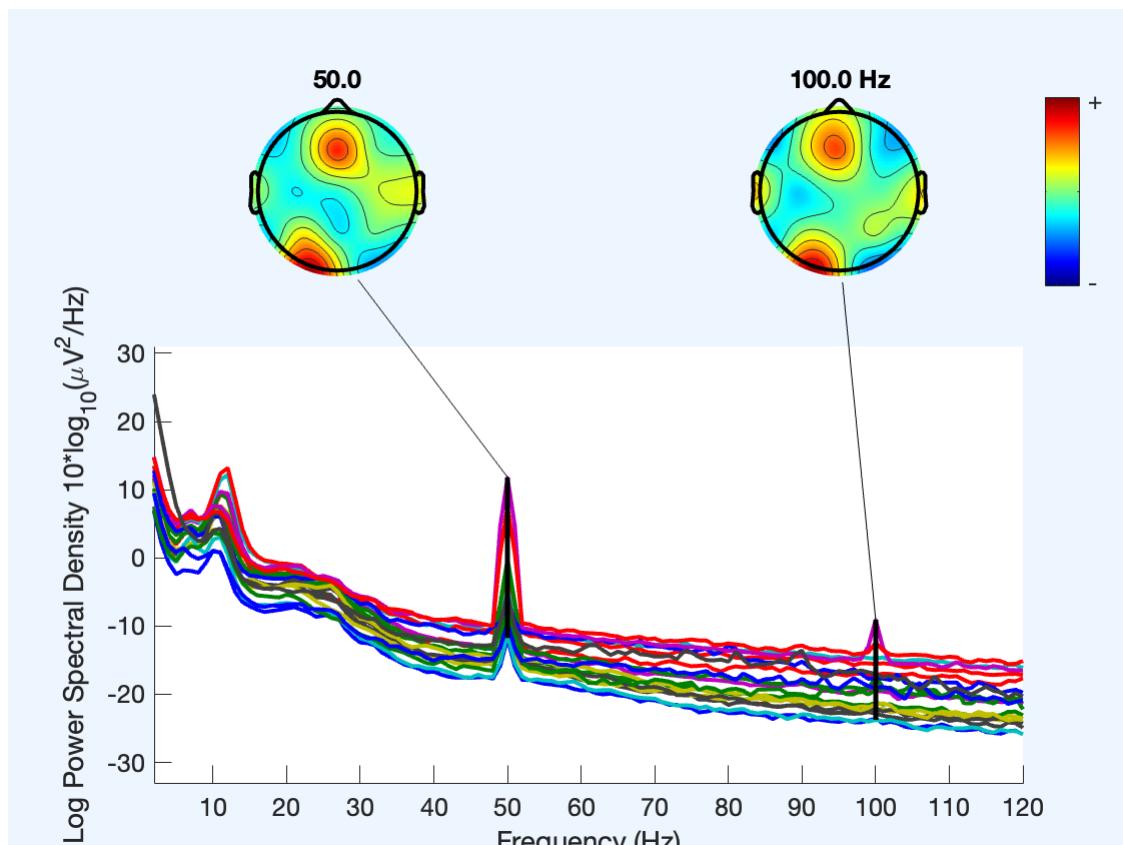
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

Click on each trace for channel/component index



Running cleanLineNoise (new version of cleanline)...

Pop_spectopo: finding data discontinuities

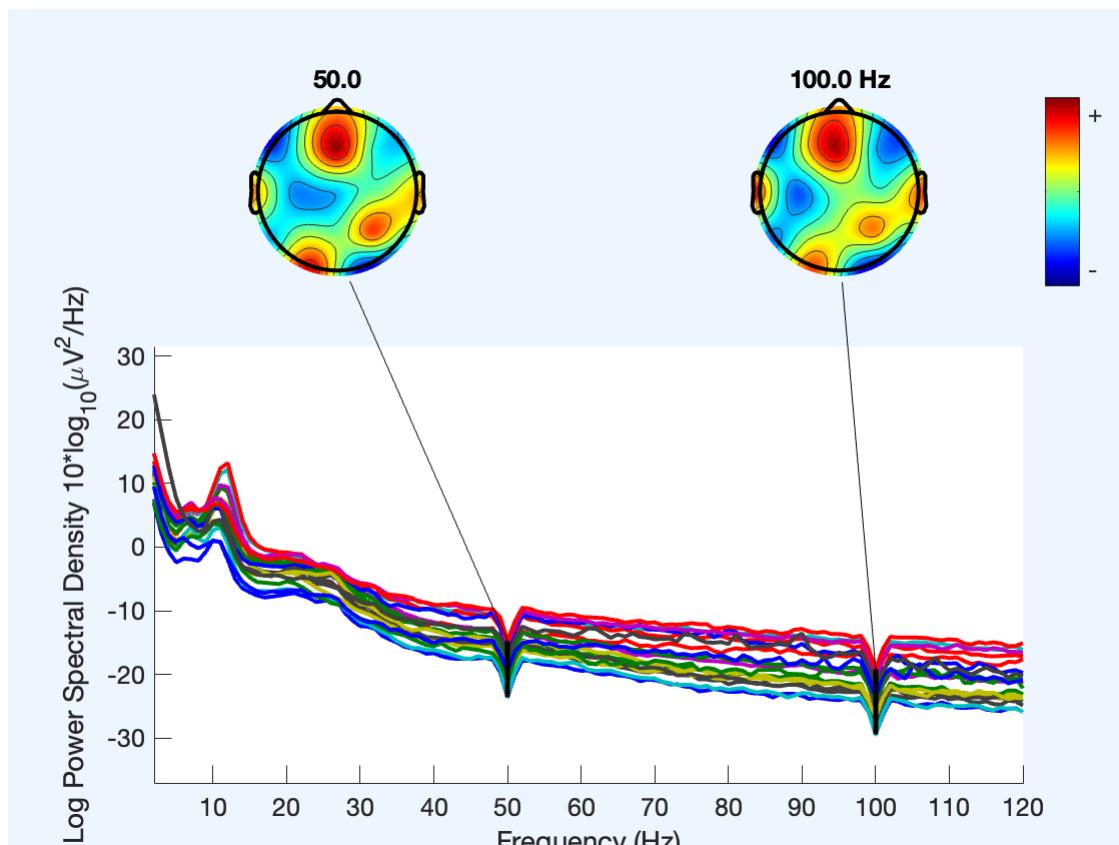
Computing spectra (window length 500; fft length: 500; overlap 0):

.....
Plotting scalp distributions: ..

Click on each trace for channel/component index

resampling data 250.0000 Hz

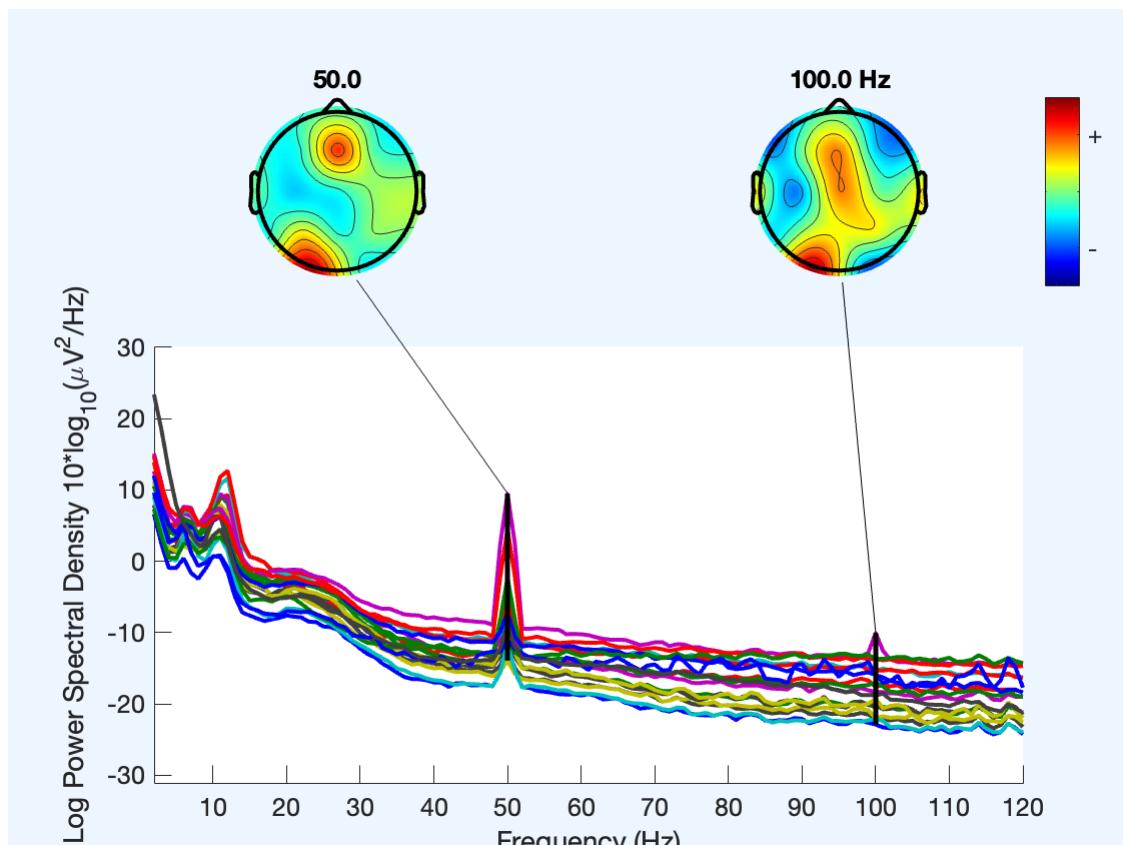
1 2 3 4 5 6 7 8 9 10 11 12 13 14



```

15 16 17 18
resampling event latencies...
resampling finished
Saving data for A18 with filename: A18_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A18 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/3/A18_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index

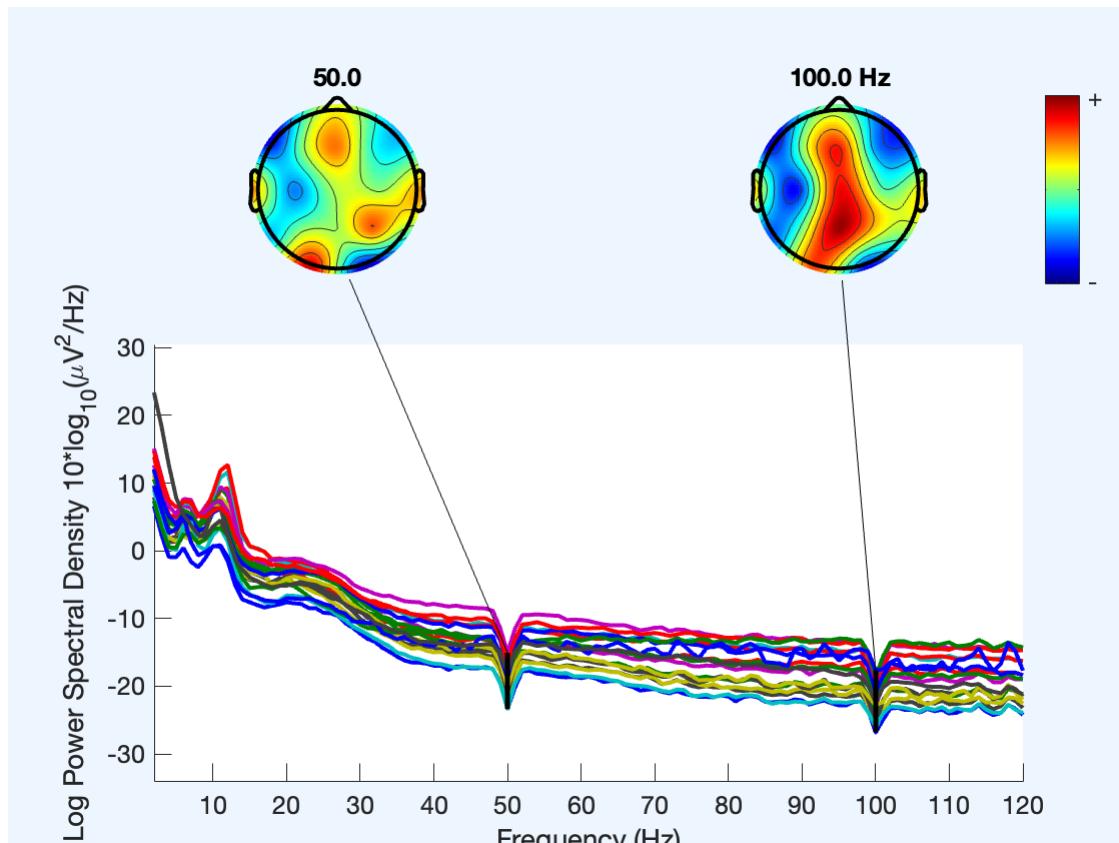
```



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A18 with filename: A18_3_upevent_mark_PrepocD1.set
 Saving dataset...

Processing subject: A19 for folder 1

pop_loadset(): loading file ../nback_study_VR_EEG_data/A19/1/A19_1_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

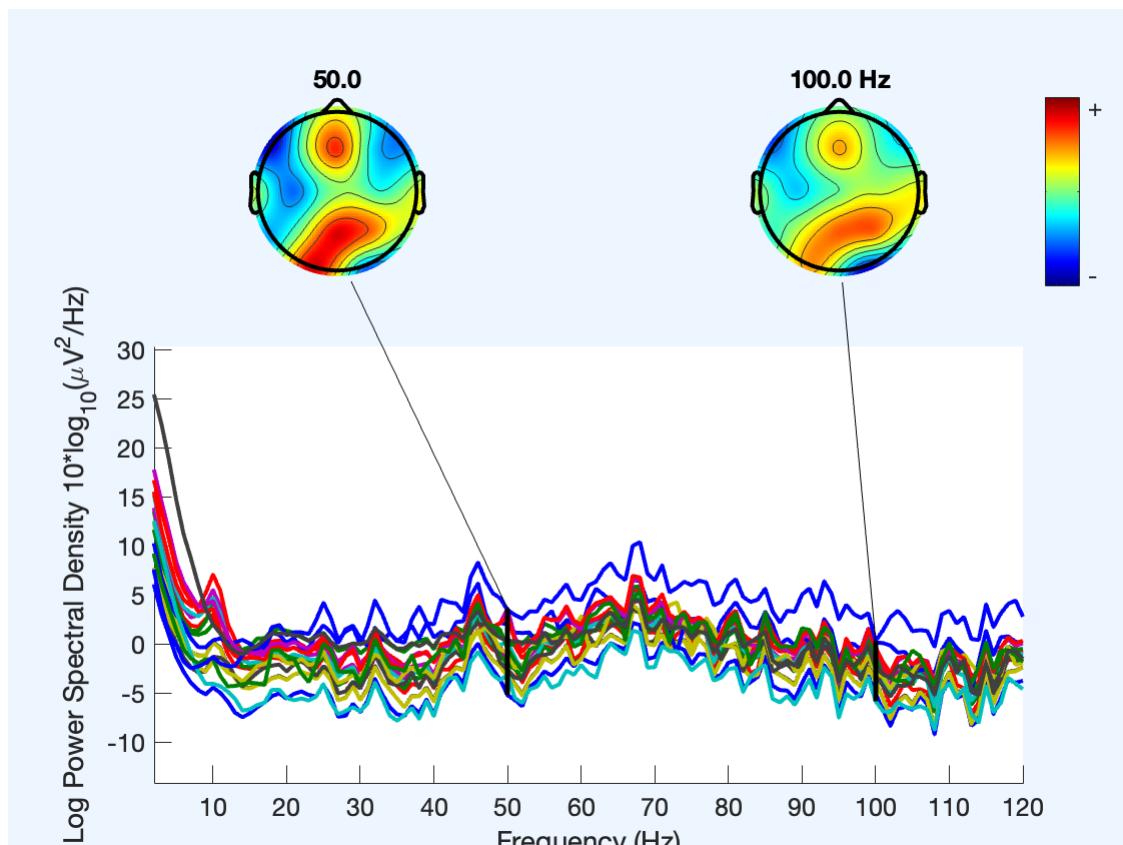
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

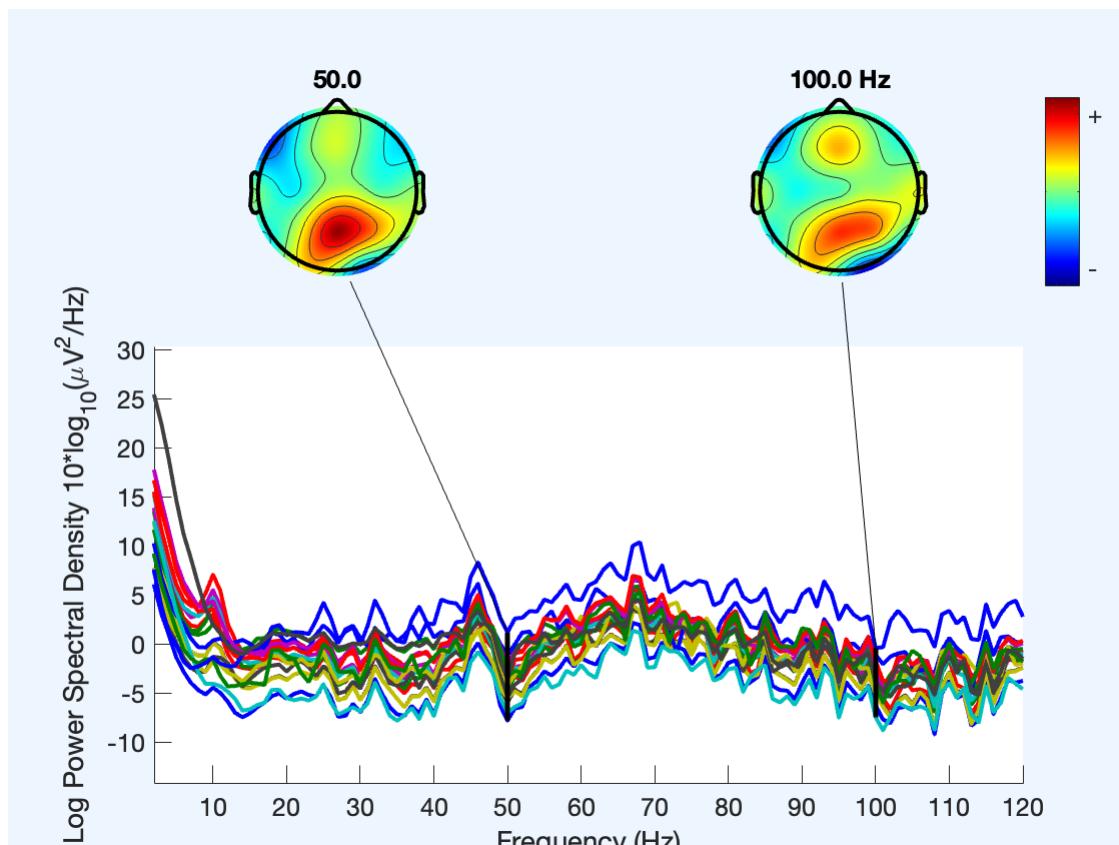
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A19 with filename: A19_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A19 for folder 2

pop_loadset(): loading file/nback_study_VR_EEG_data/A19/2/A19_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

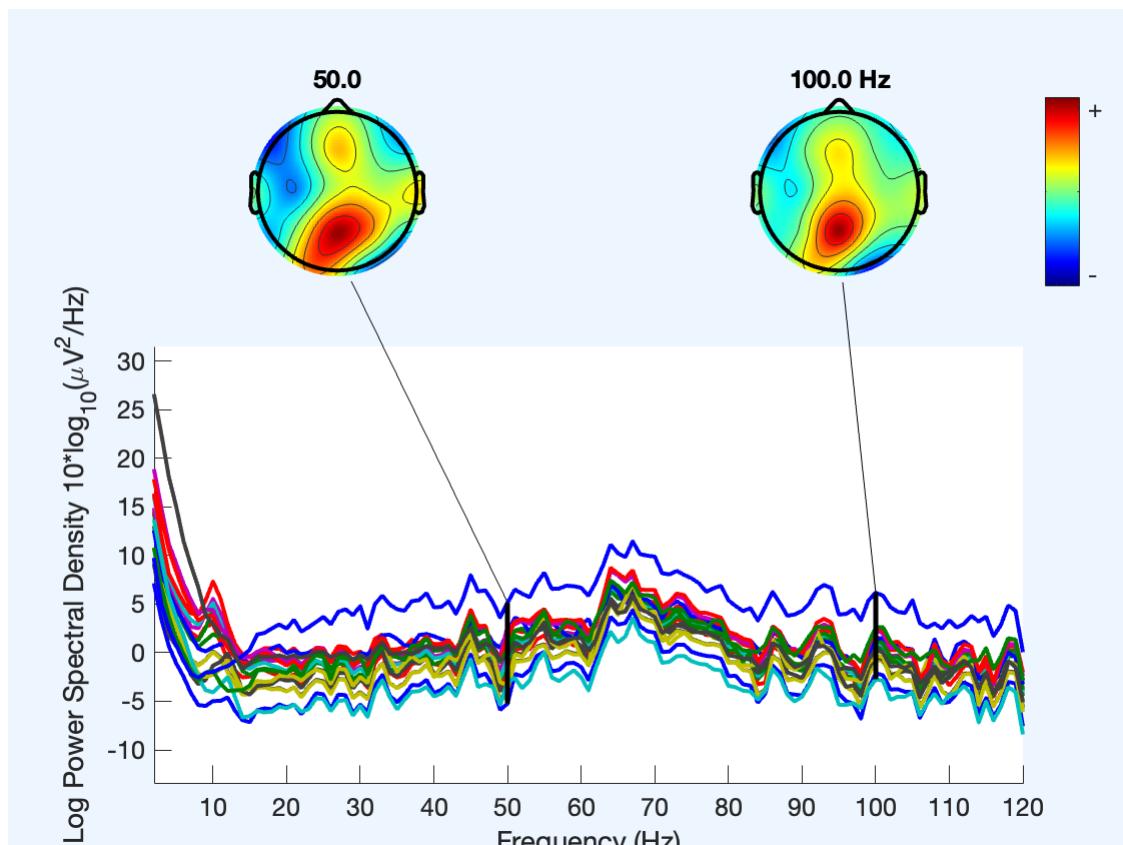
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

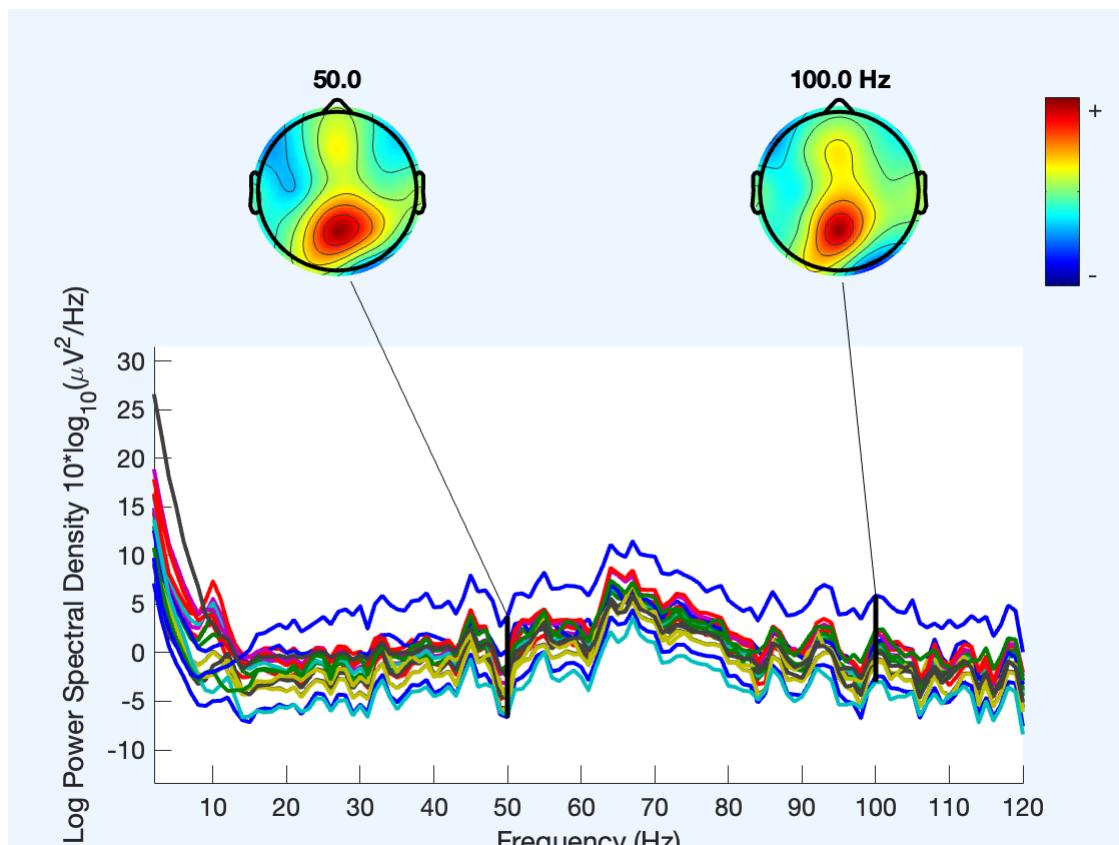
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A19 with filename: A19_2_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A19 for folder 3

pop_loadset(): loading file ../nback_study_VR_EEG_data/A19/3/A19_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

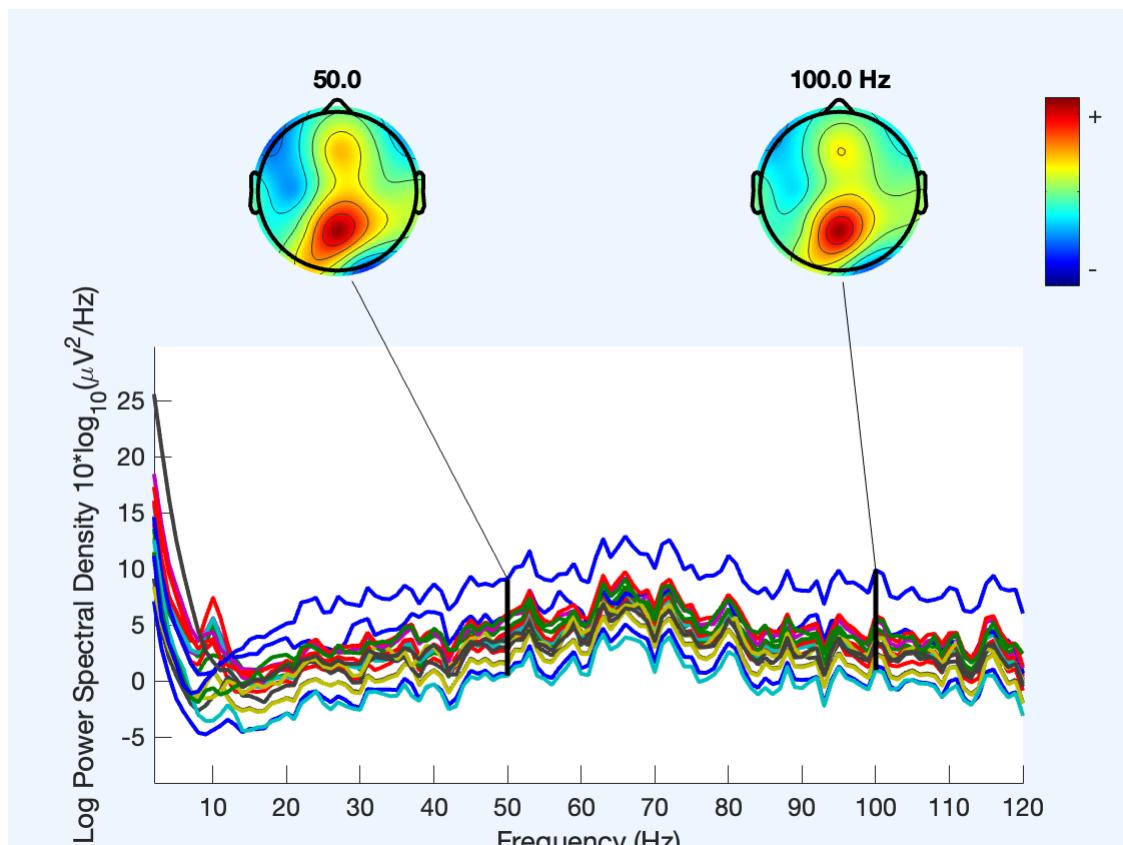
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

Click on each trace for channel/component index



Running cleanLineNoise (new version of cleanline)...

Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....
Plotting scalp distributions: ..

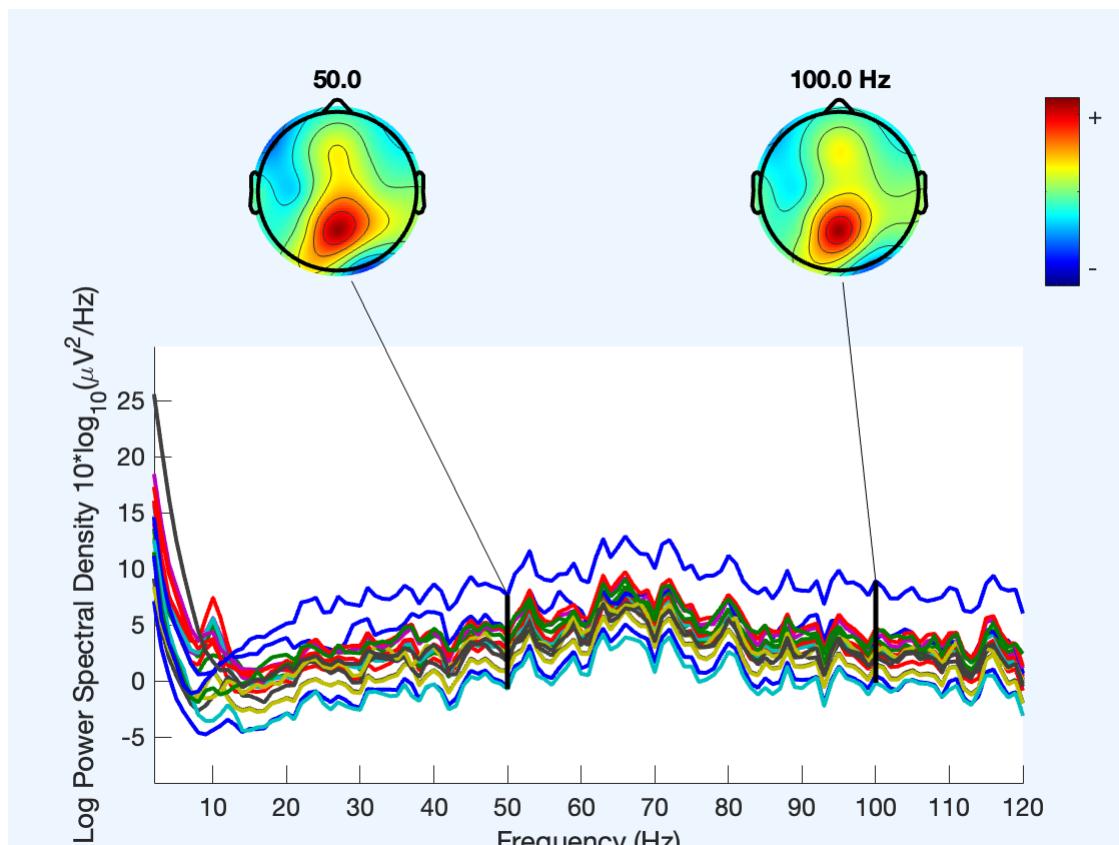
Click on each trace for channel/component index

resampling data 250.0000 Hz

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

resampling event latencies...

resampling finished



Saving data for A19 with filename: A19_3_upevent_mark_PrepocD1.set
 Saving dataset...

Processing subject: A20 for folder 1

pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/1/A20_1_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

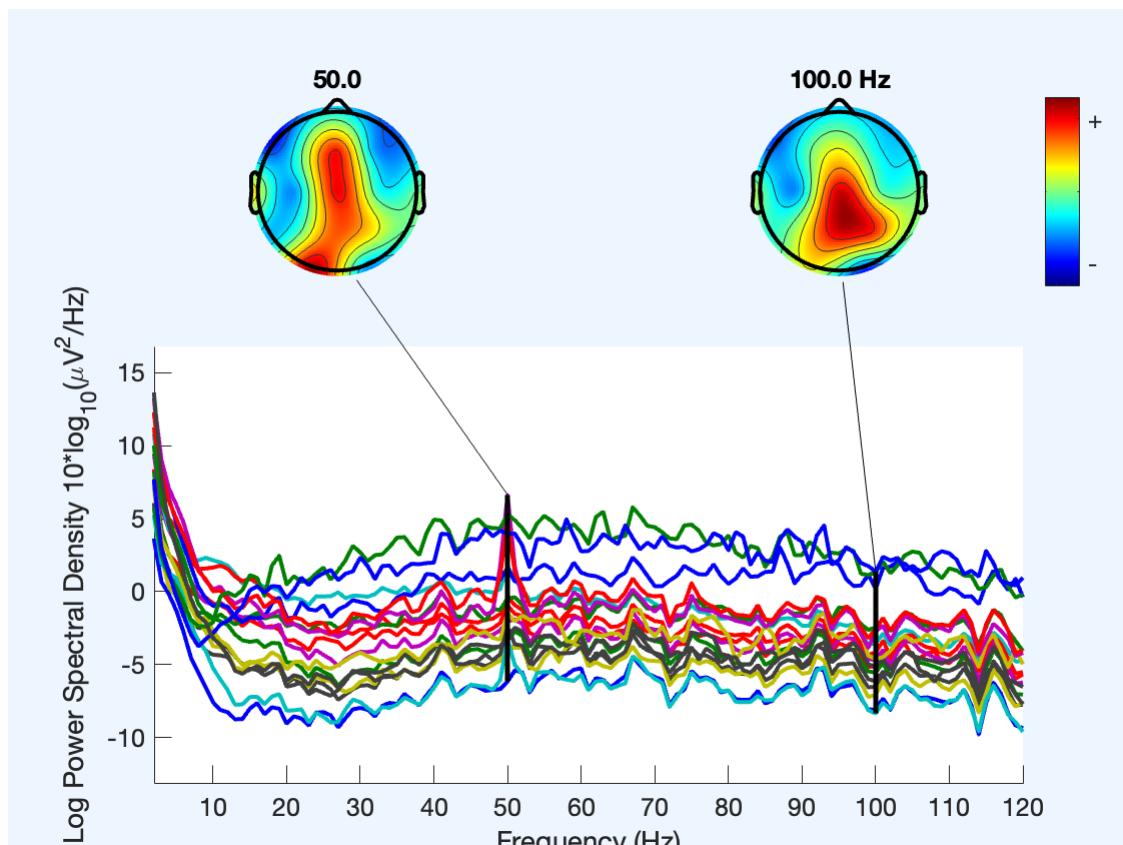
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

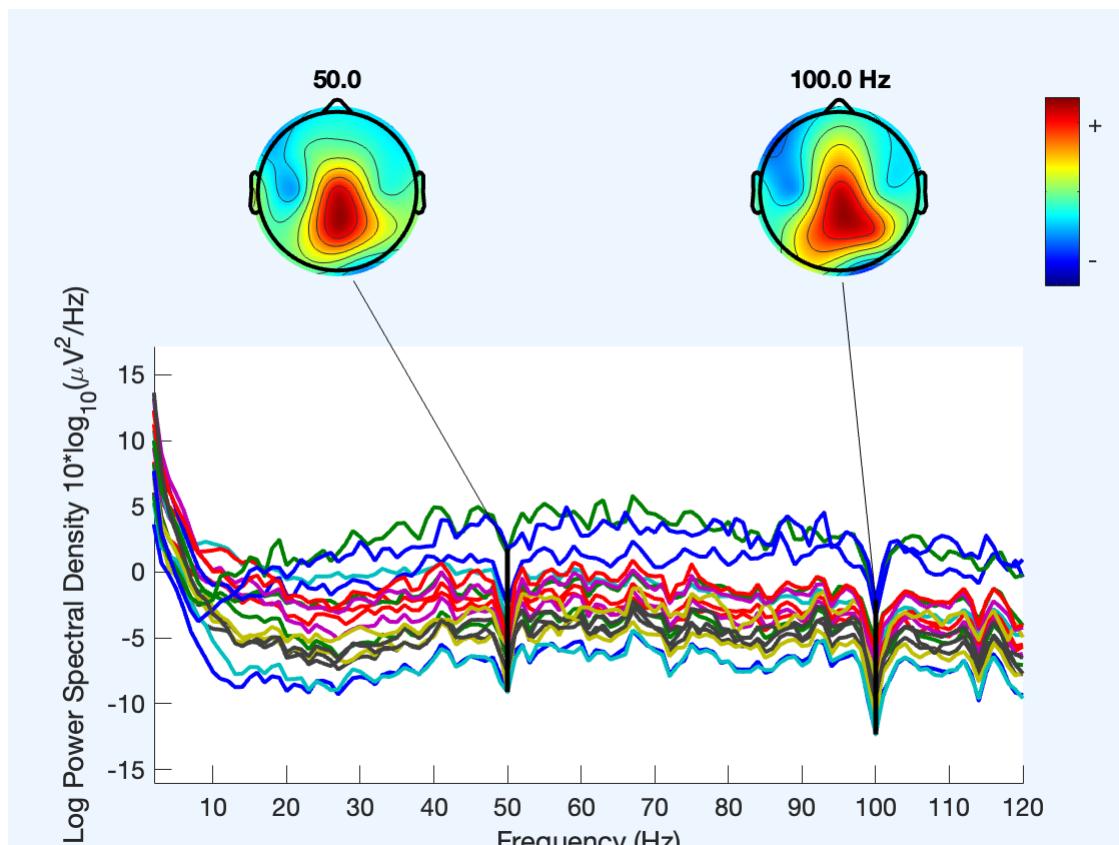
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A20 with filename: A20_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A20 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/2/A20_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

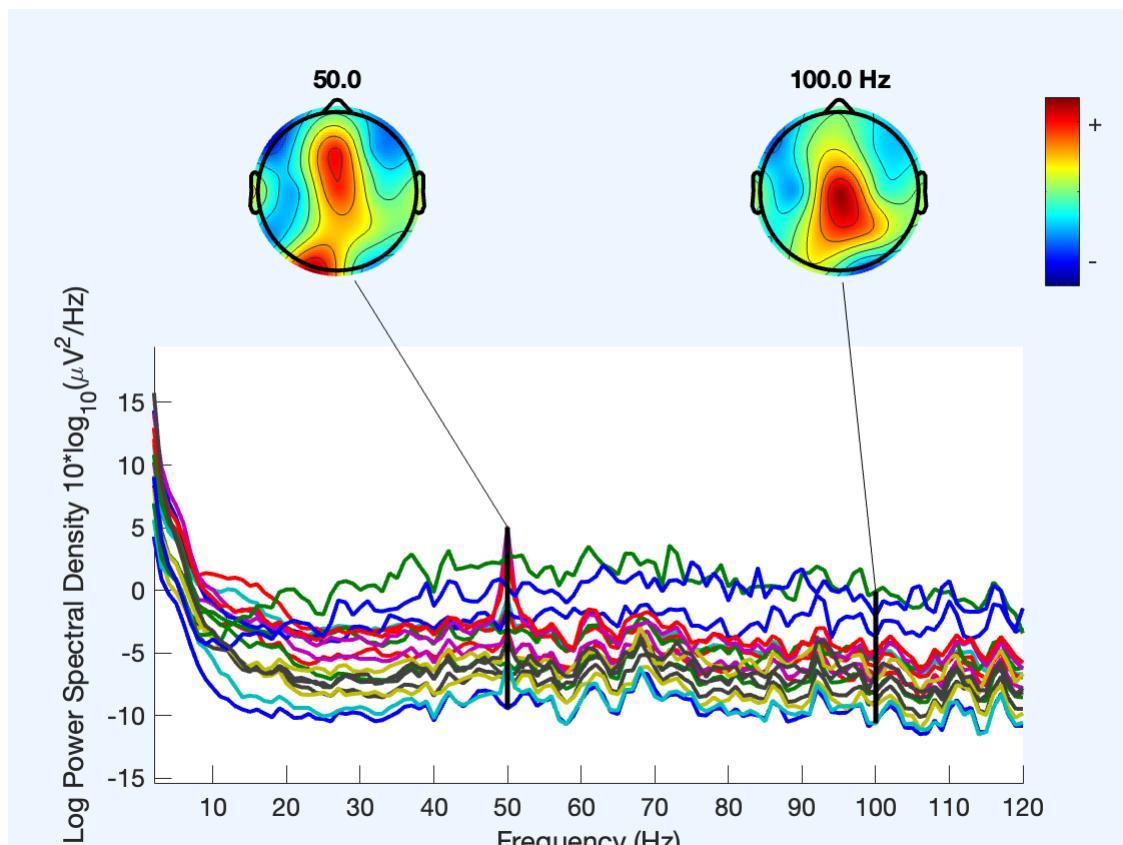
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

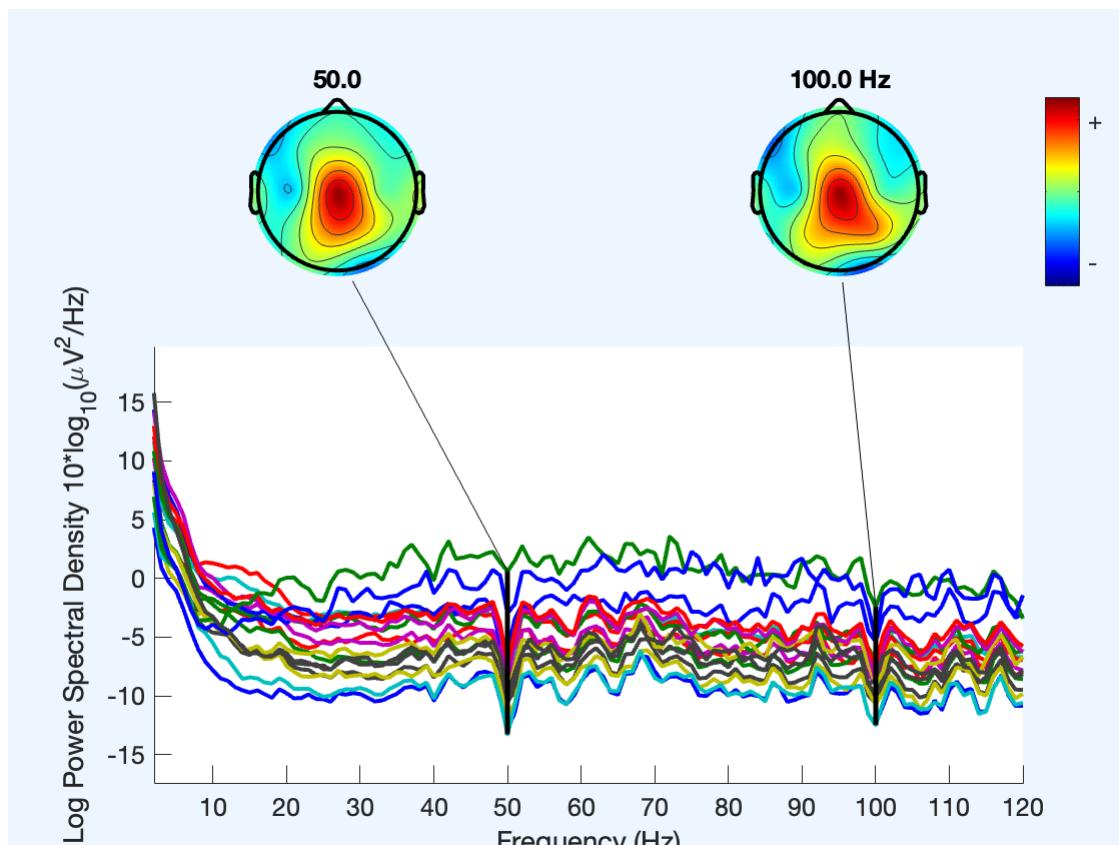
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A20 with filename: A20_2_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A20 for folder 3

pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/3/A20_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

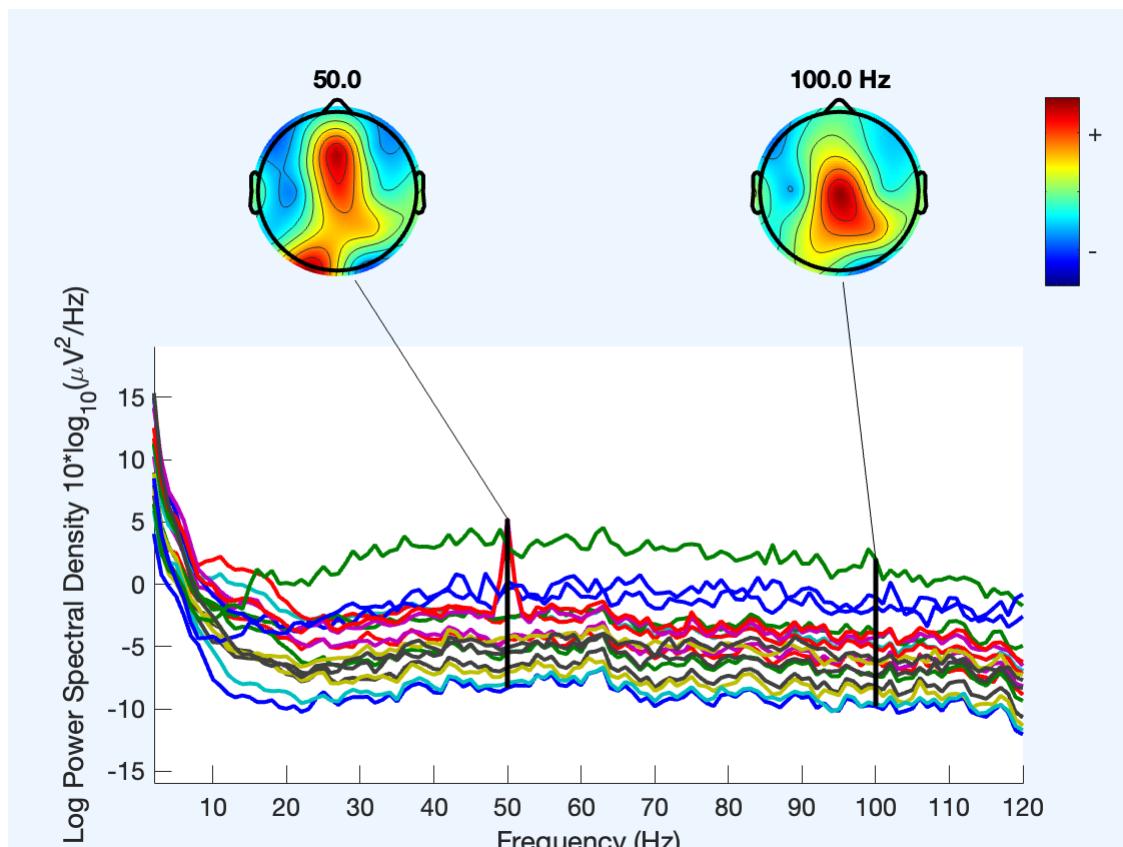
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

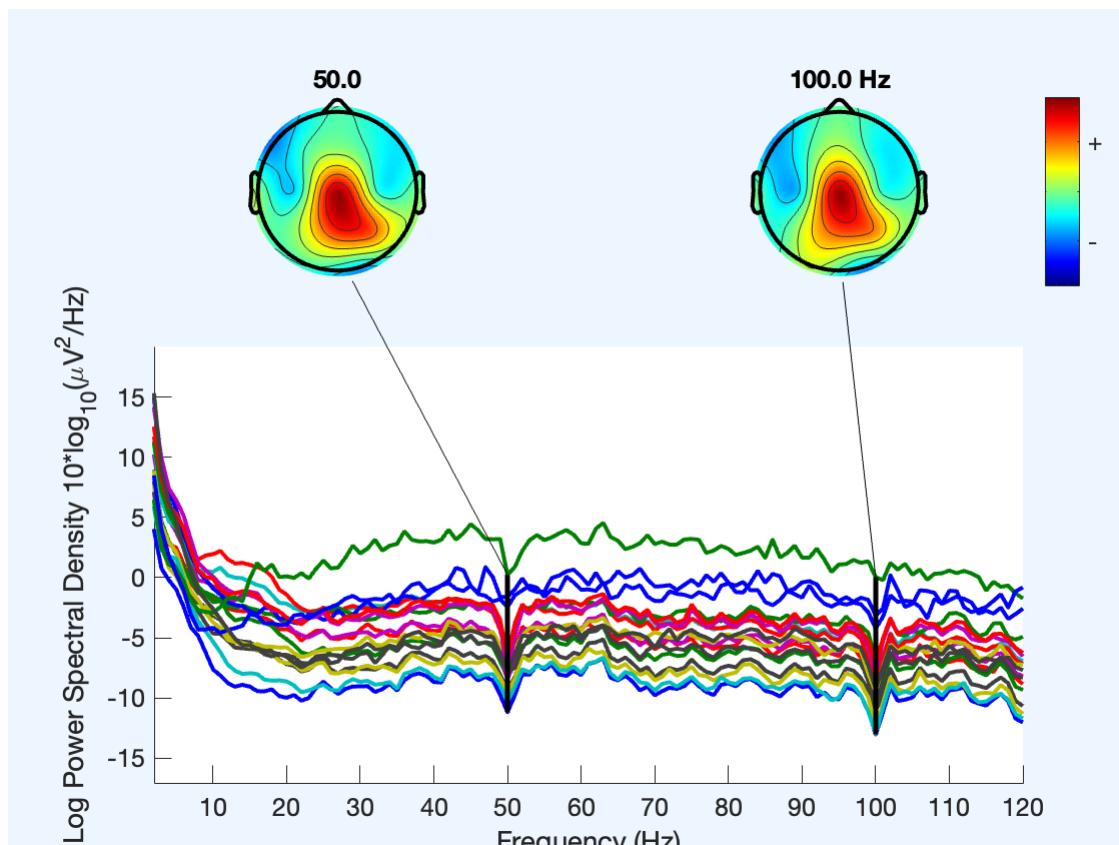
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A20 with filename: A20_3_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A21 for folder 1

pop_loadset(): loading file/nback_study_VR_EEG_data/A21/1/A21_1_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

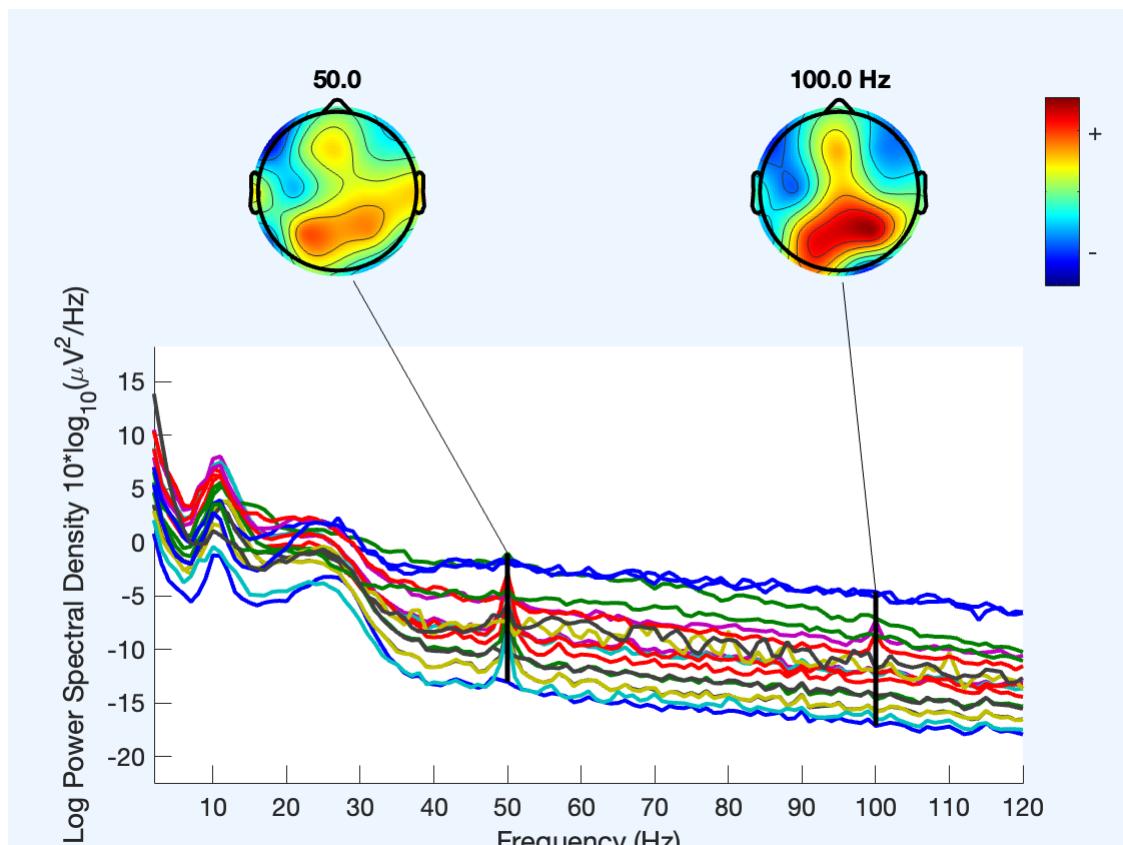
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

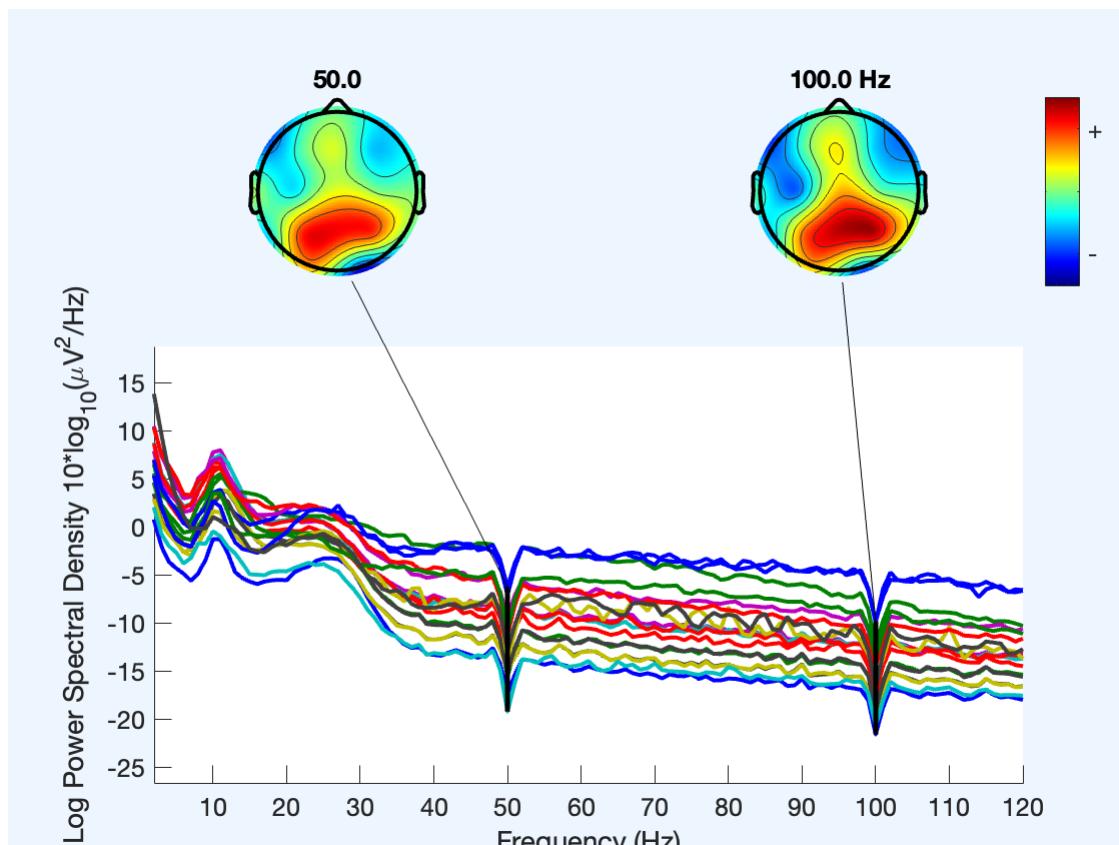
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A21 with filename: A21_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A21 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A21/2/A21_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

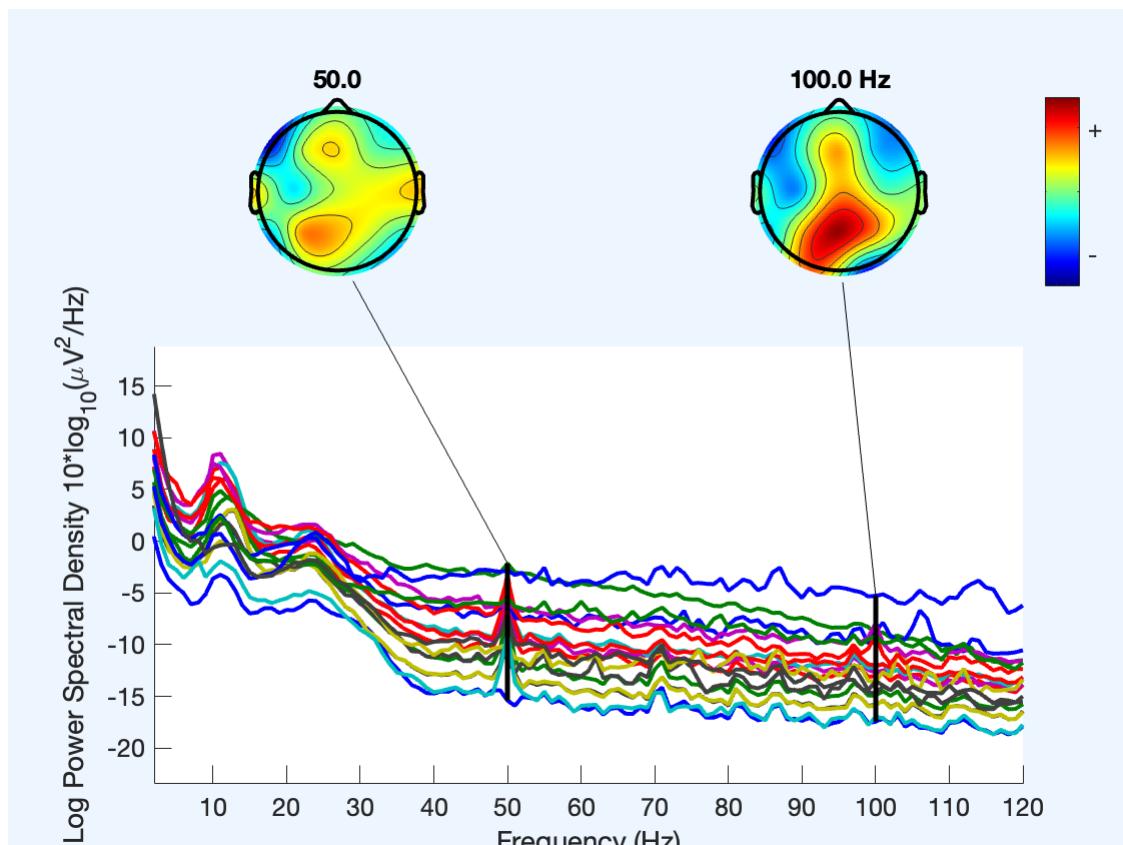
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

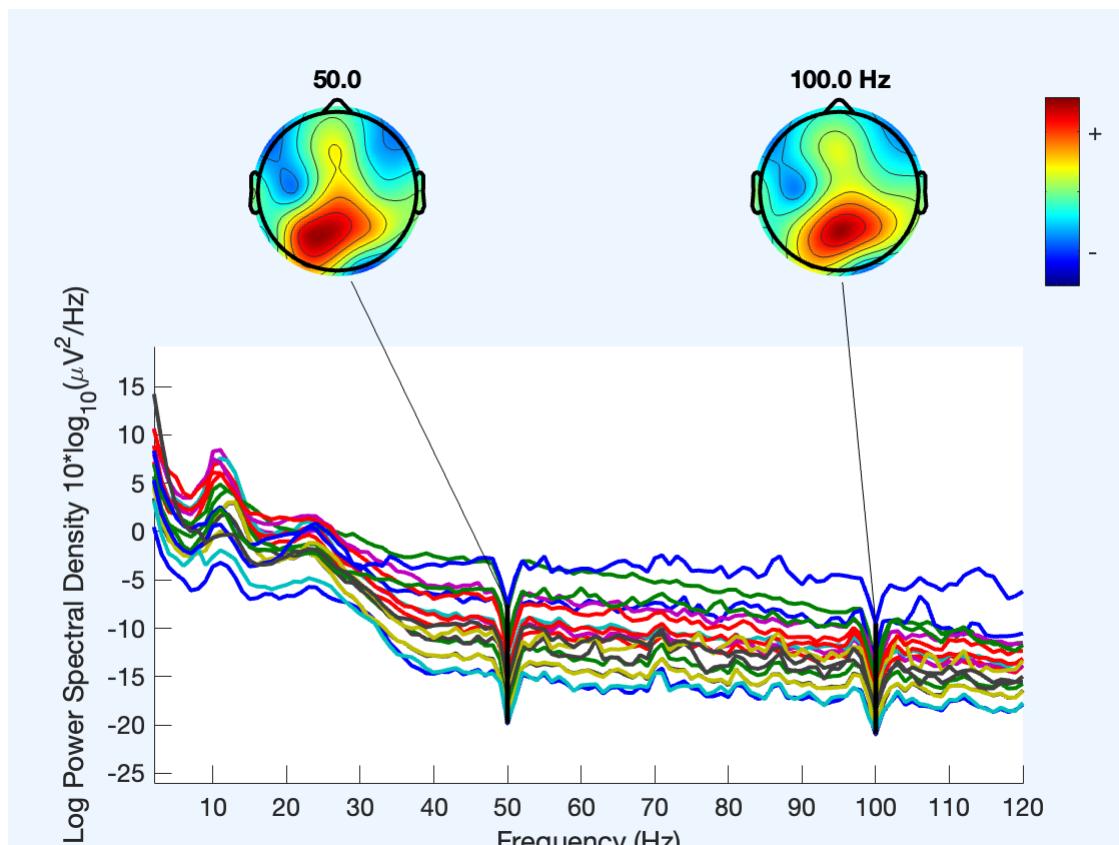
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A21 with filename: A21_2_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A21 for folder 3

pop_loadset(): loading file/nback_study_VR_EEG_data/A21/3/A21_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

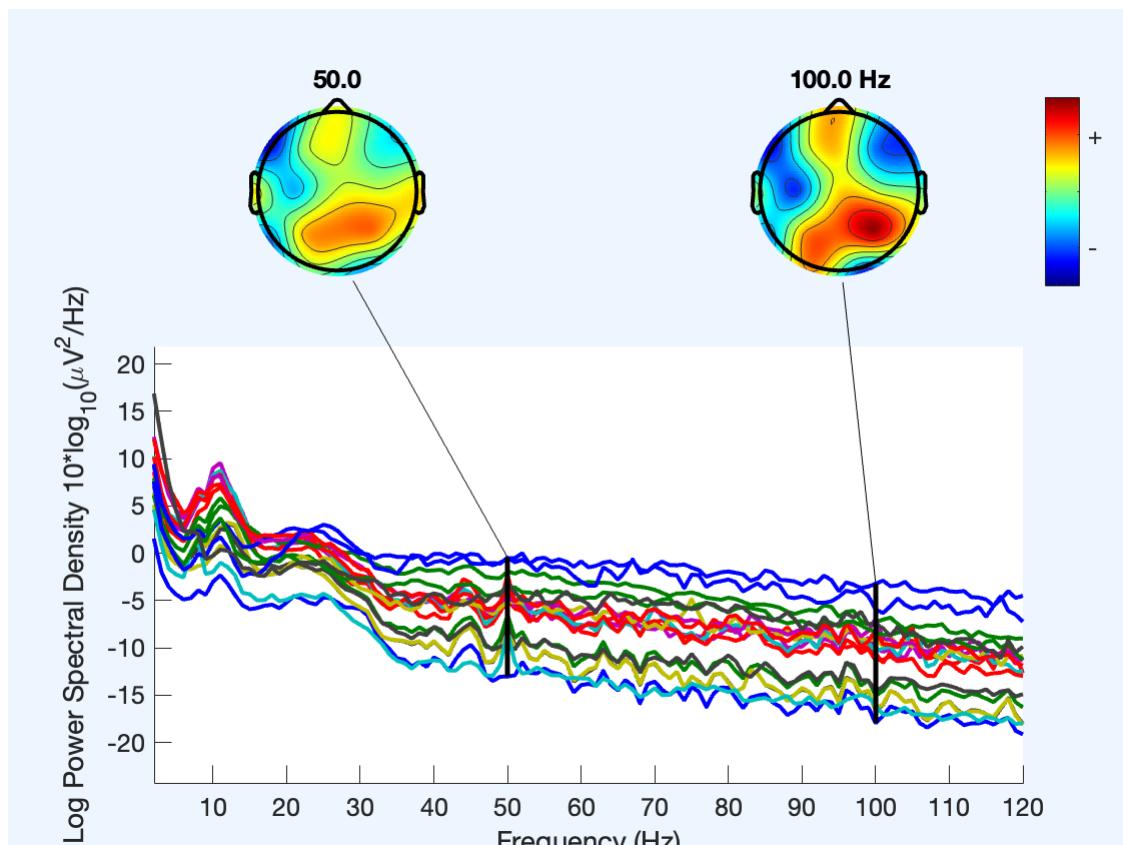
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

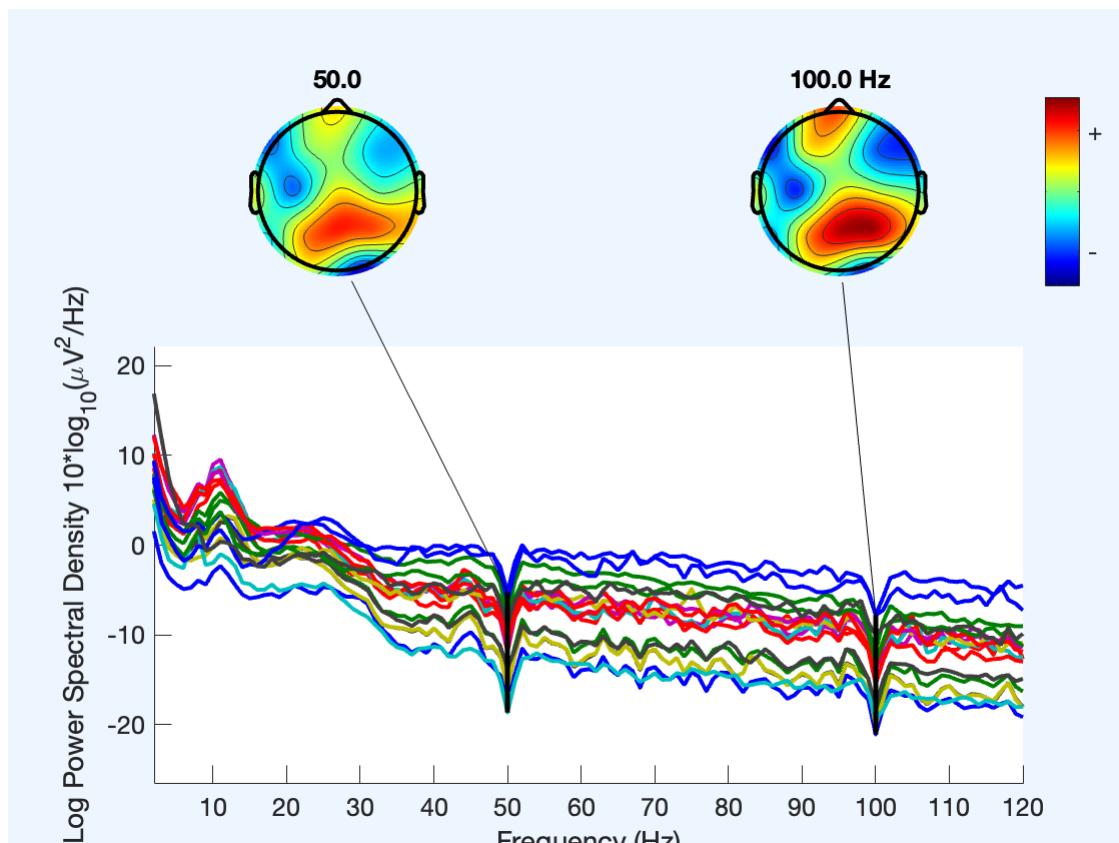
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13

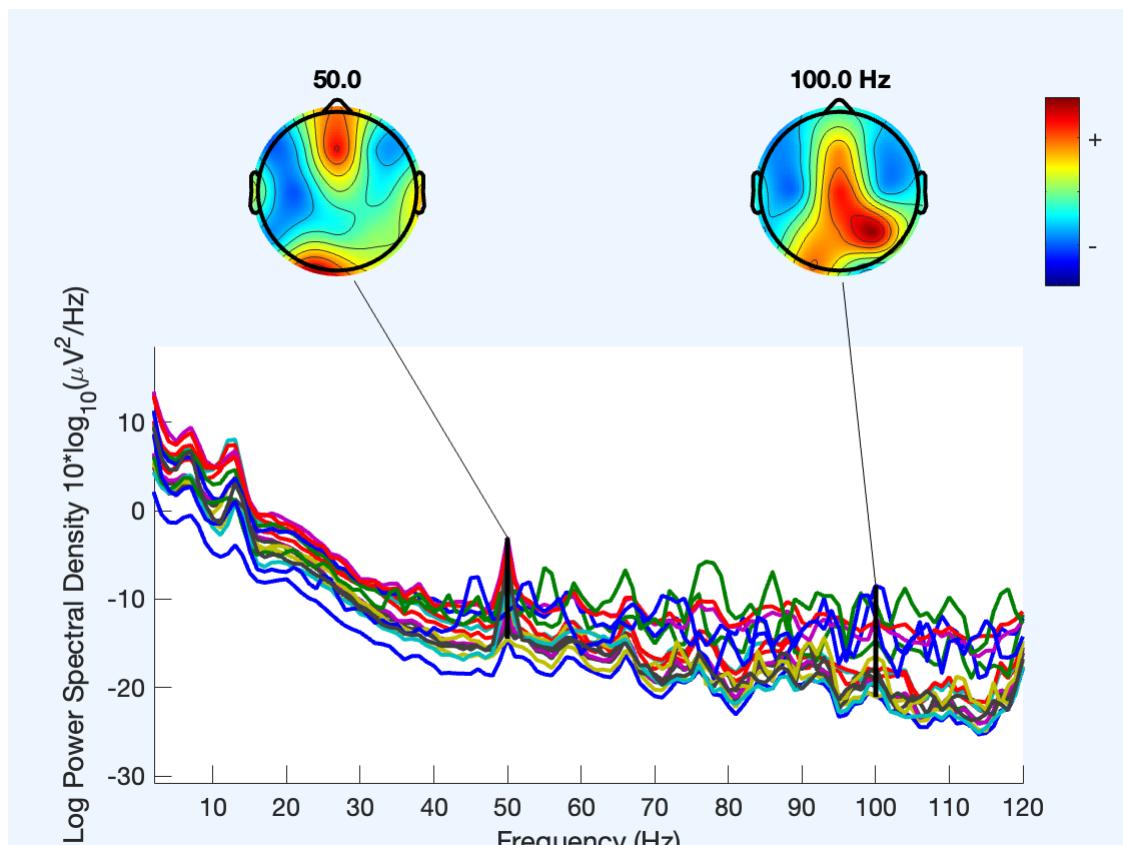
```



```

14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A21 with filename: A21_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A22 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/1/A22_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index

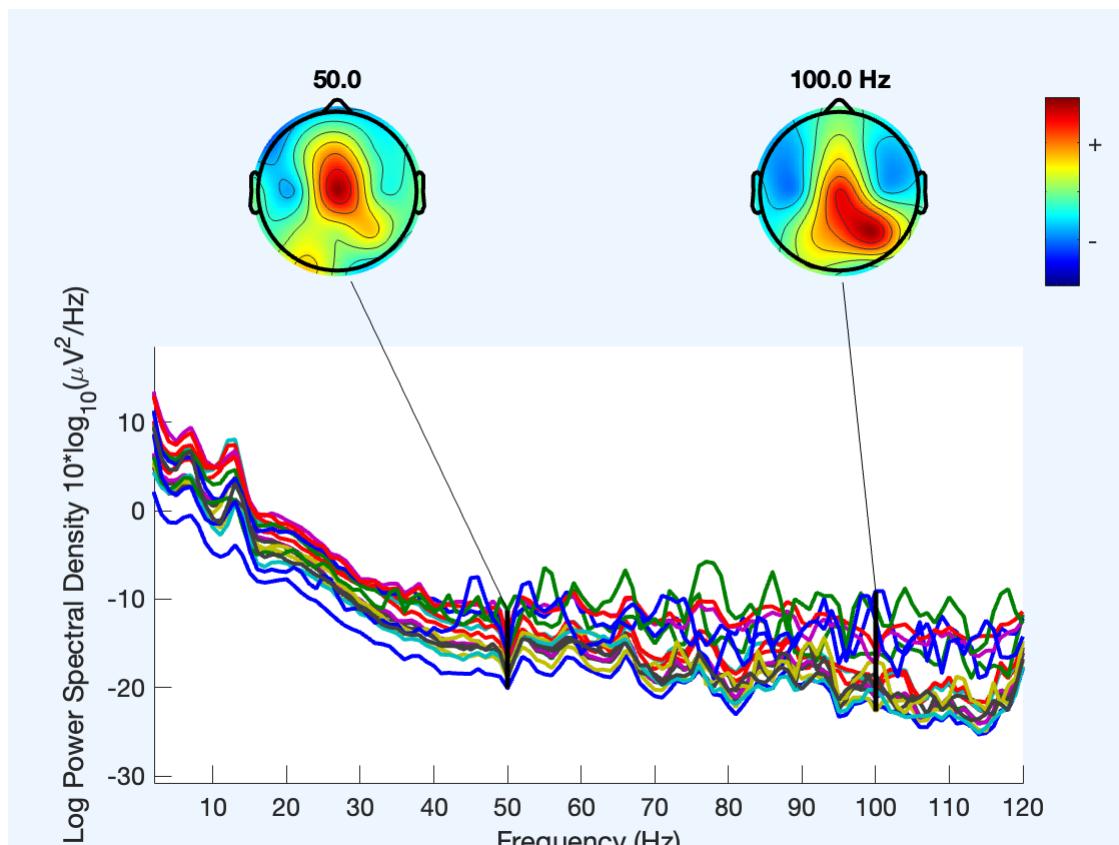
```



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A22 with filename: A22_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A22 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/2/A22_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

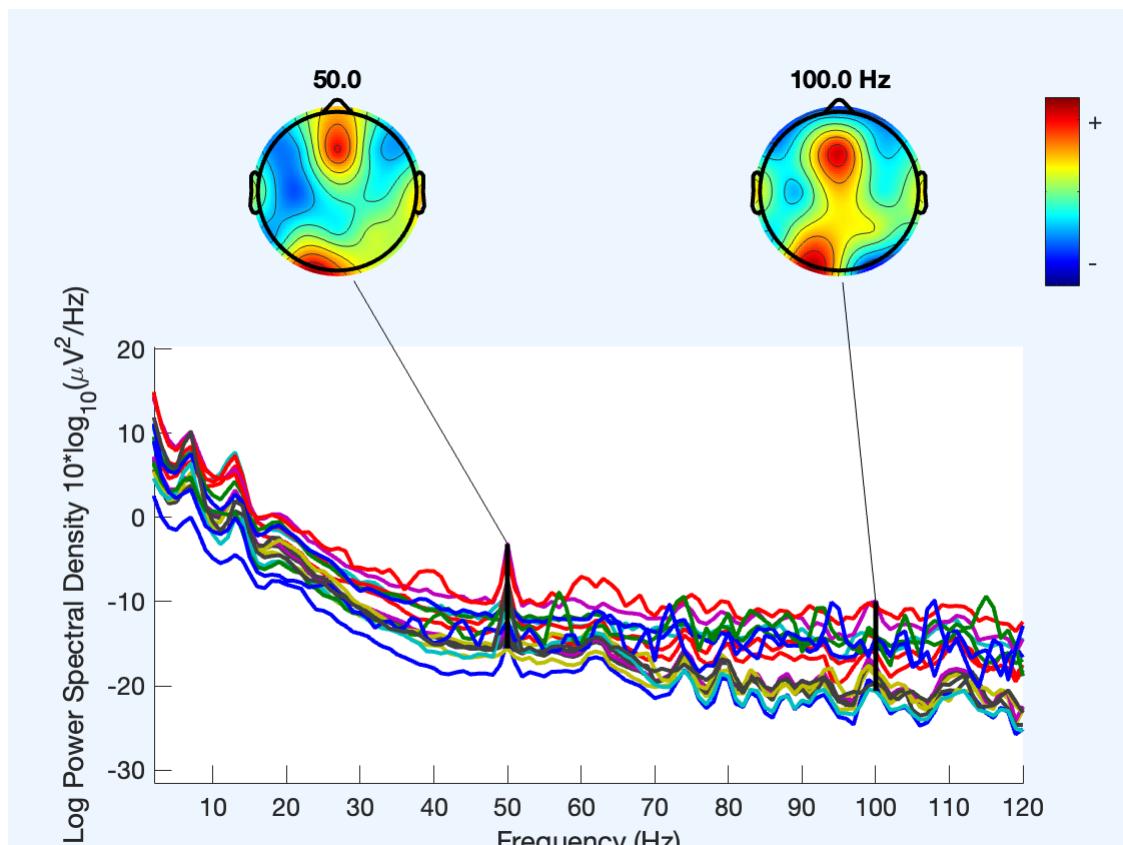
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

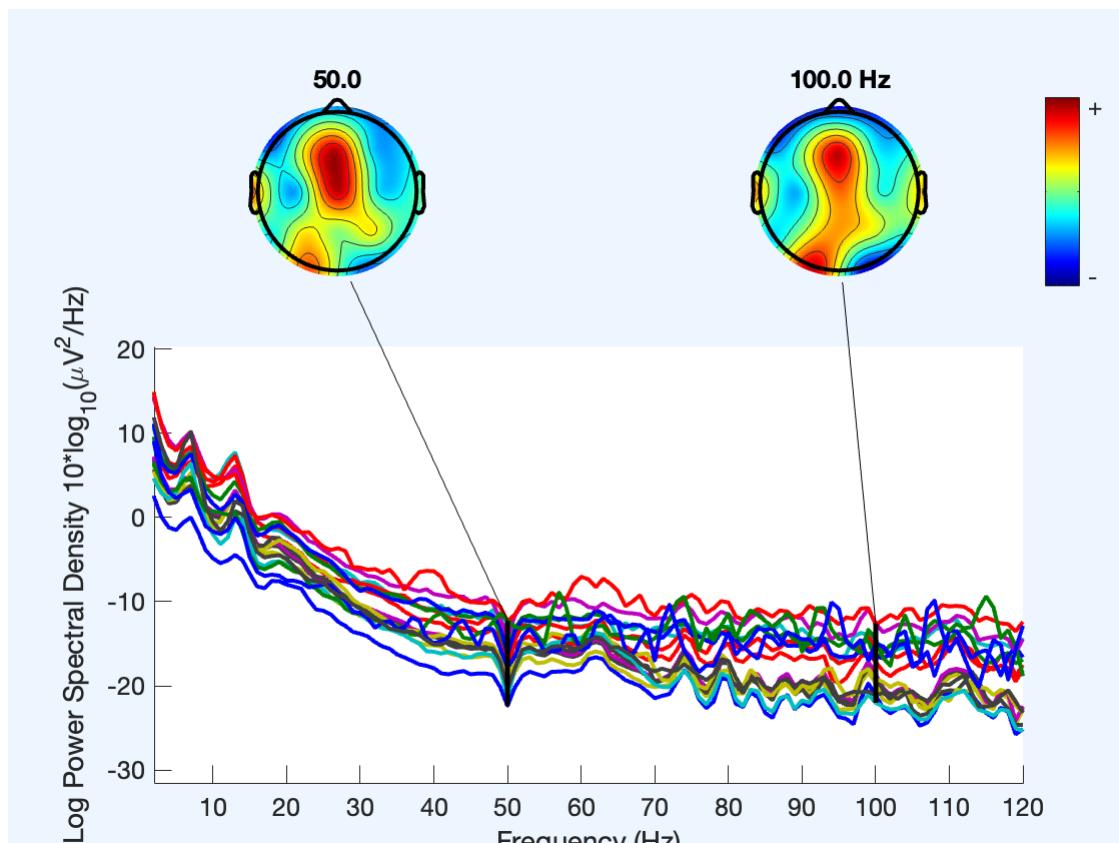
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index

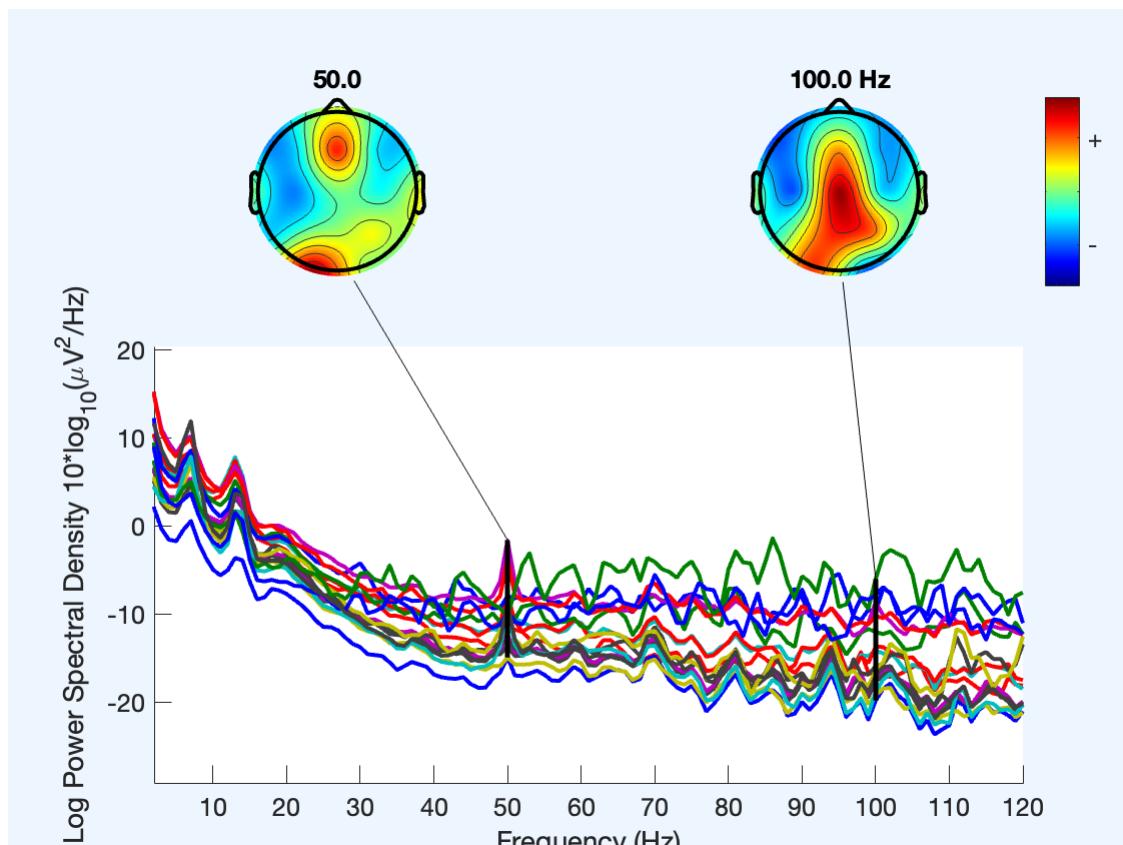
```



```

resampling data 250.000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A22 with filename: A22_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A22 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/3/A22_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ...
Click on each trace for channel/component index

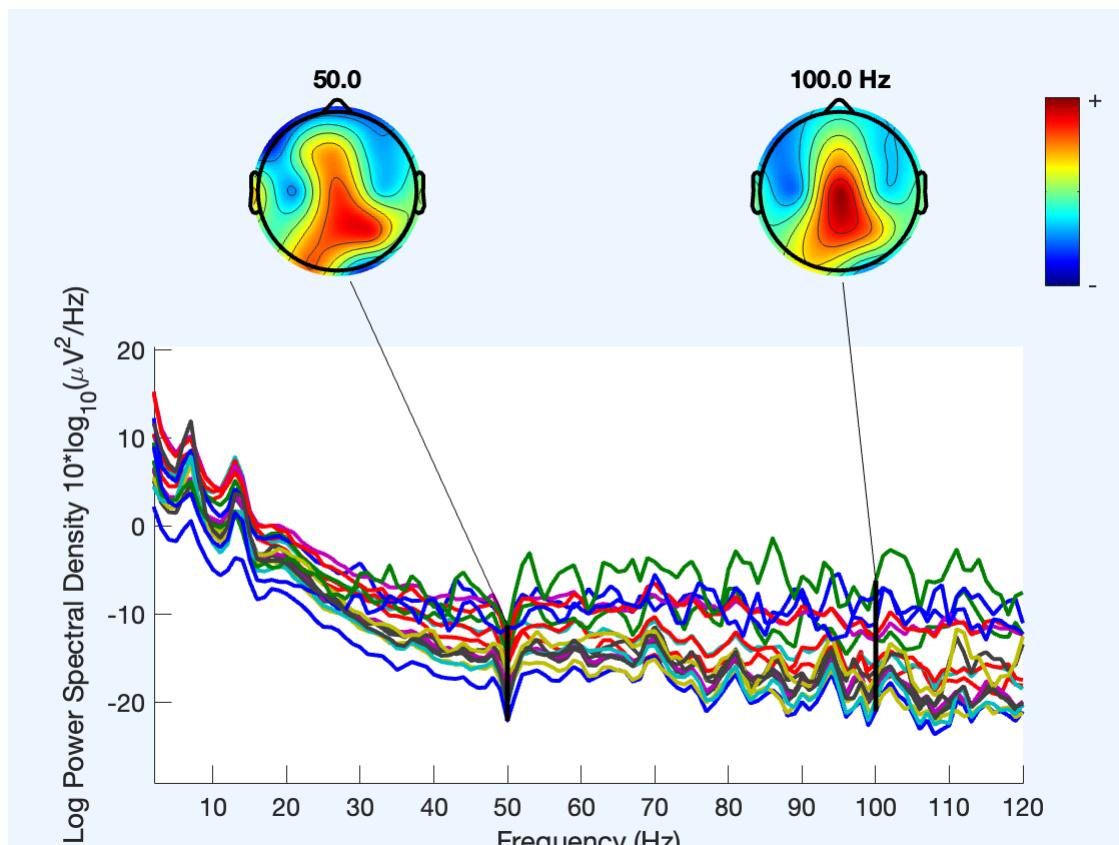
```



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A22 with filename: A22_3_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A23 for folder 1

pop_loadset(): loading file ../nback_study_VR_EEG_data/A23/1/A23_1_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

Pop_spectopo: finding data discontinuities

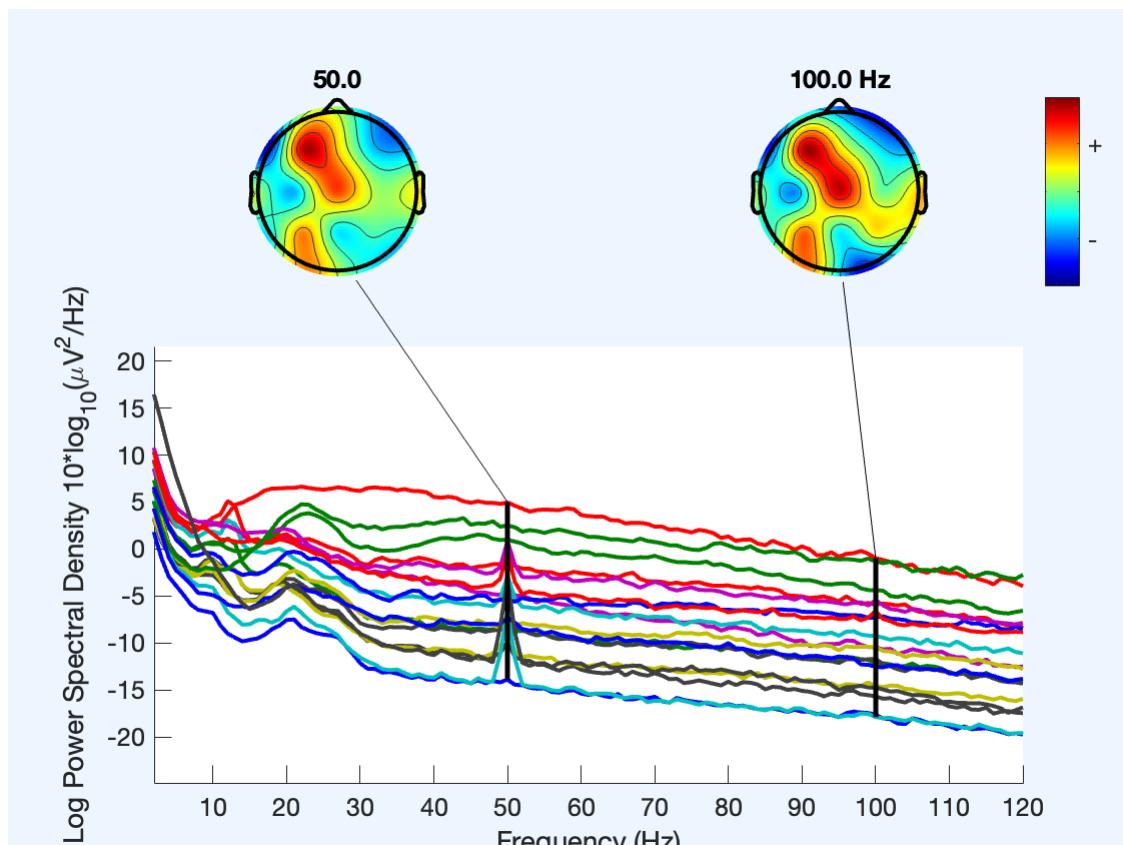
Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

Click on each trace for channel/component index

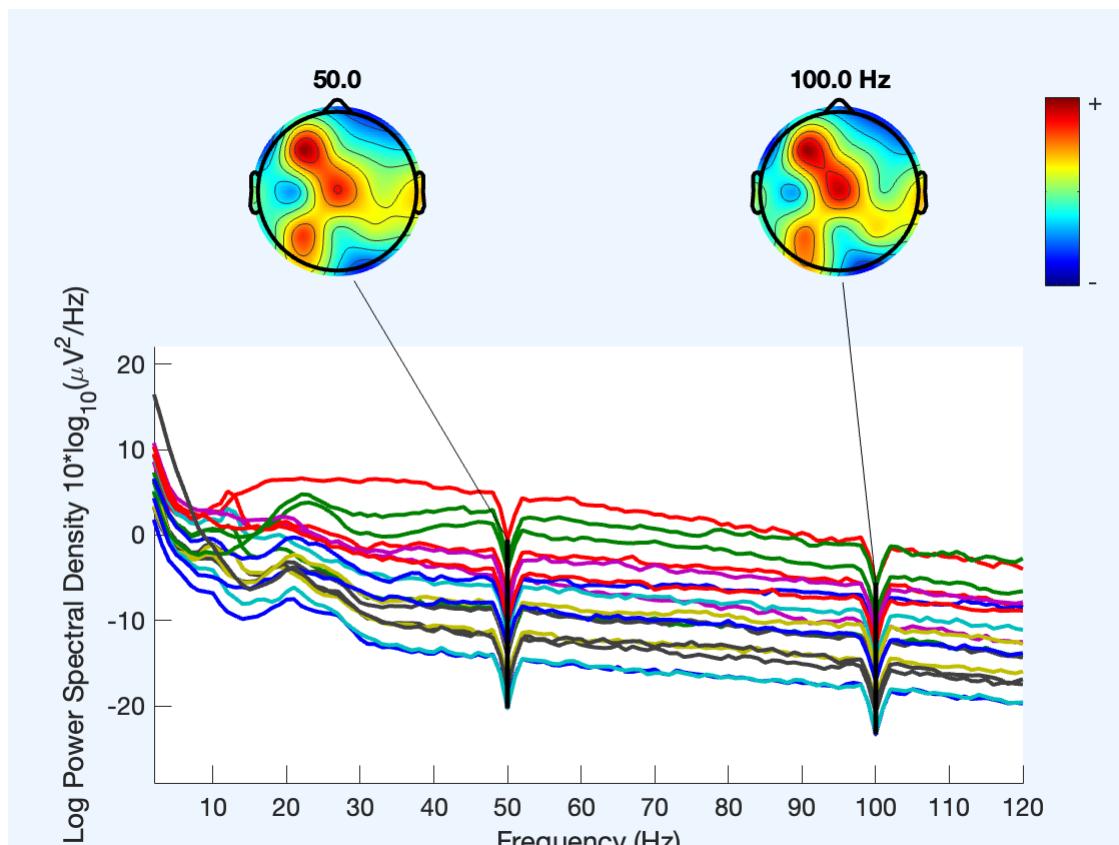
Running cleanLineNoise (new version of cleanline)...



```

Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A23 with filename: A23_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A23 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A23/2/A23_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

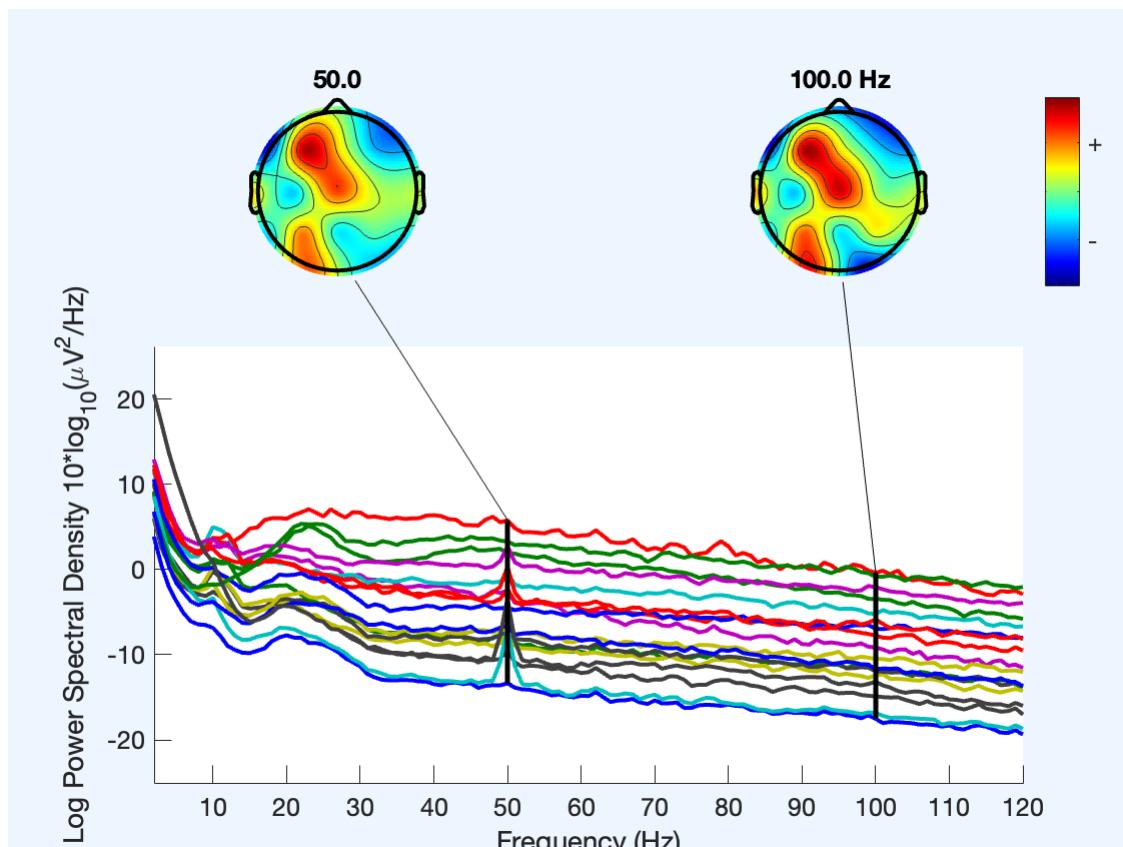
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

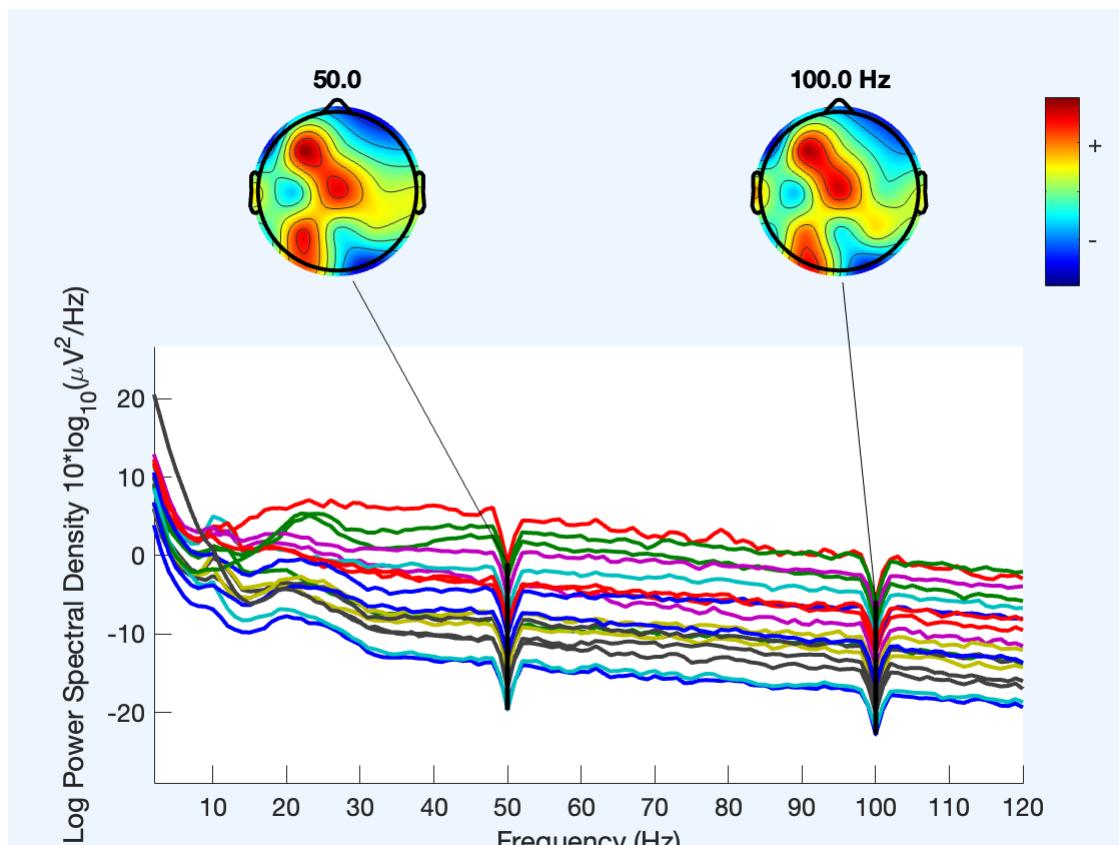
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A23 with filename: A23_2_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A23 for folder 3

pop_loadset(): loading file/nback_study_VR_EEG_data/A23/3/A23_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

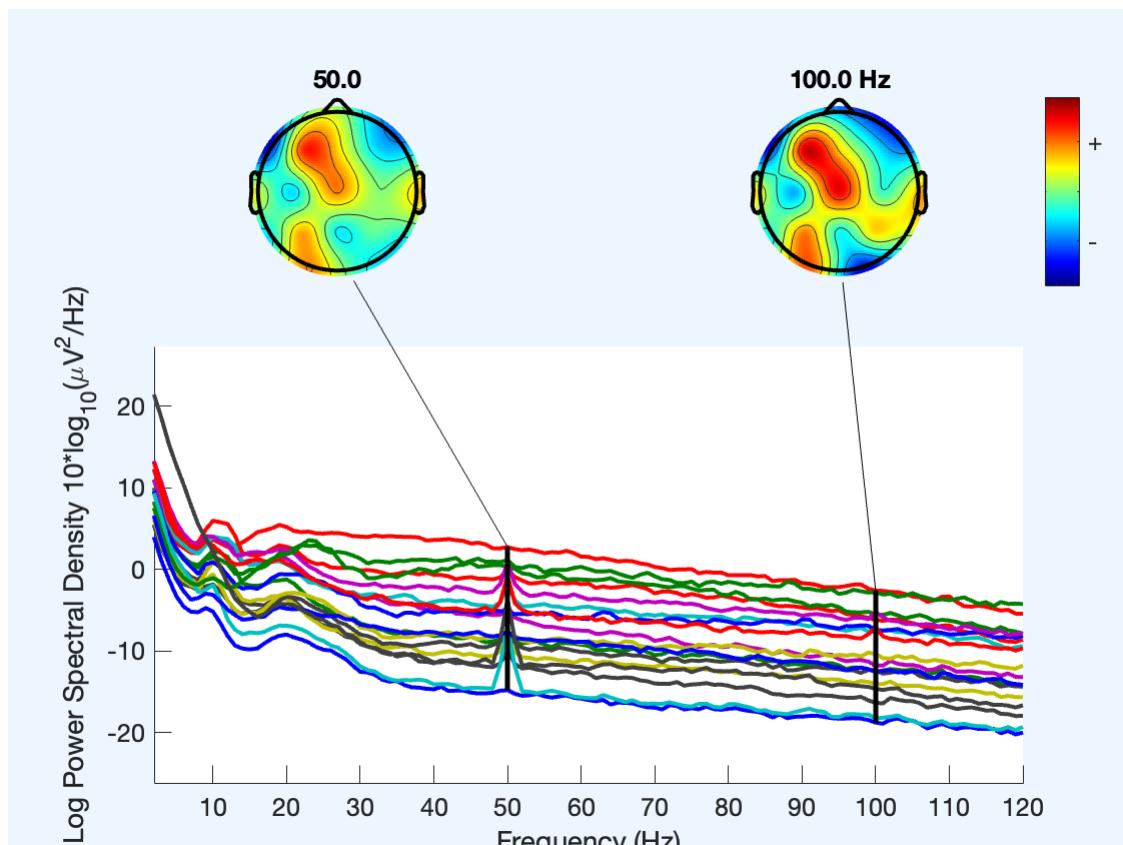
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ...

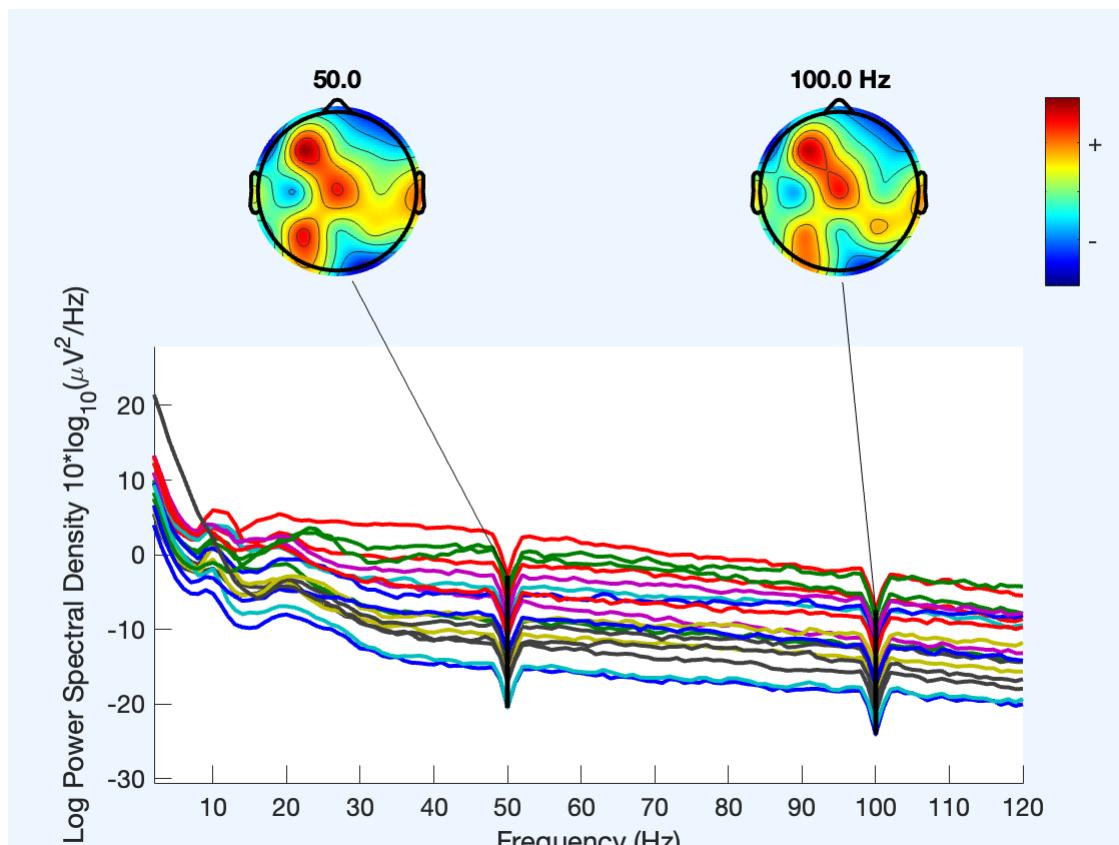
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A23 with filename: A23_3_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A24 for folder 1

pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/1/A24_1_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

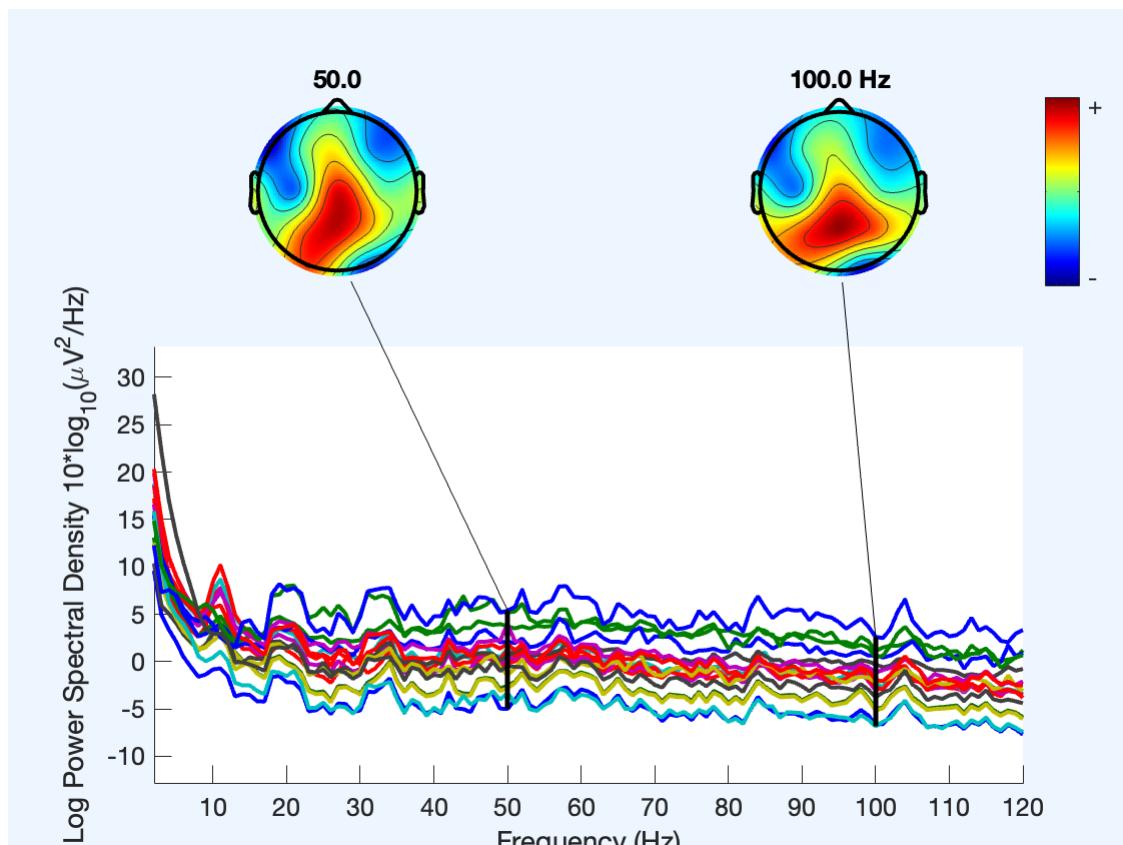
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

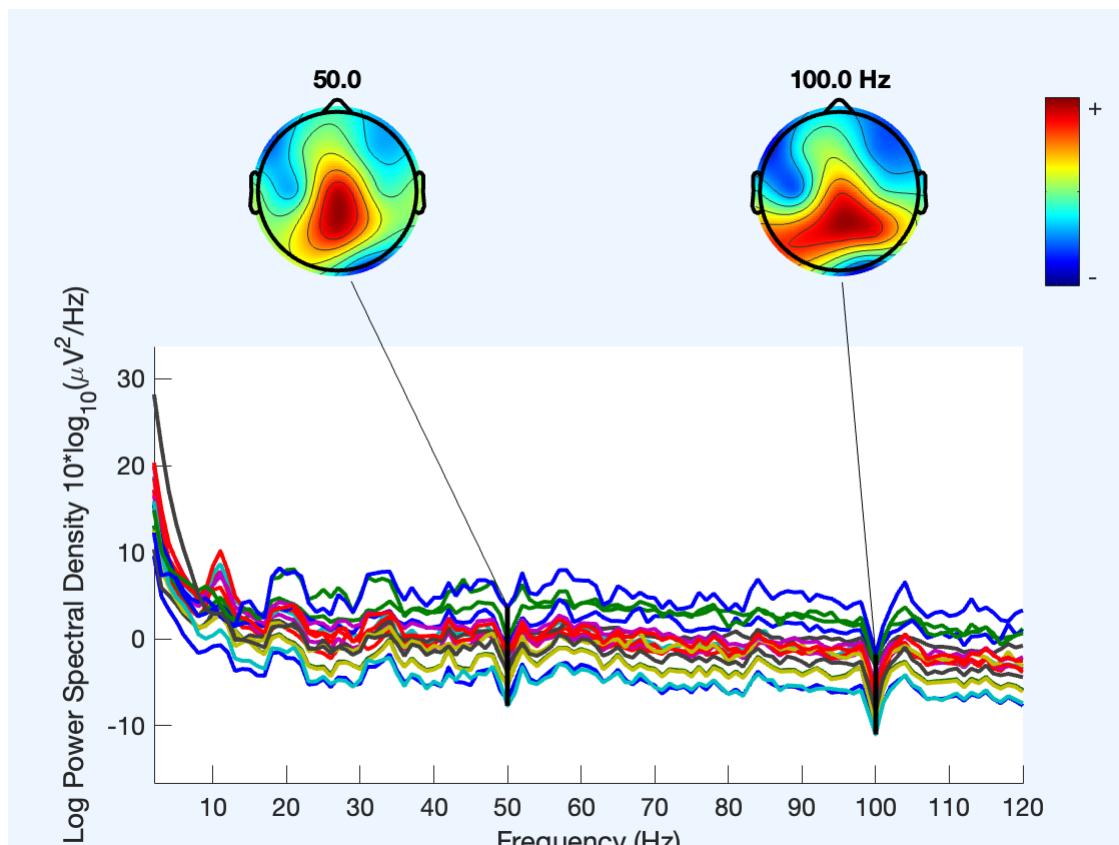
Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished

```



Saving data for A24 with filename: A24_1_upevent_mark_PrepocD1.set

Saving dataset...

Processing subject: A24 for folder 2

pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/2/A24_2_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

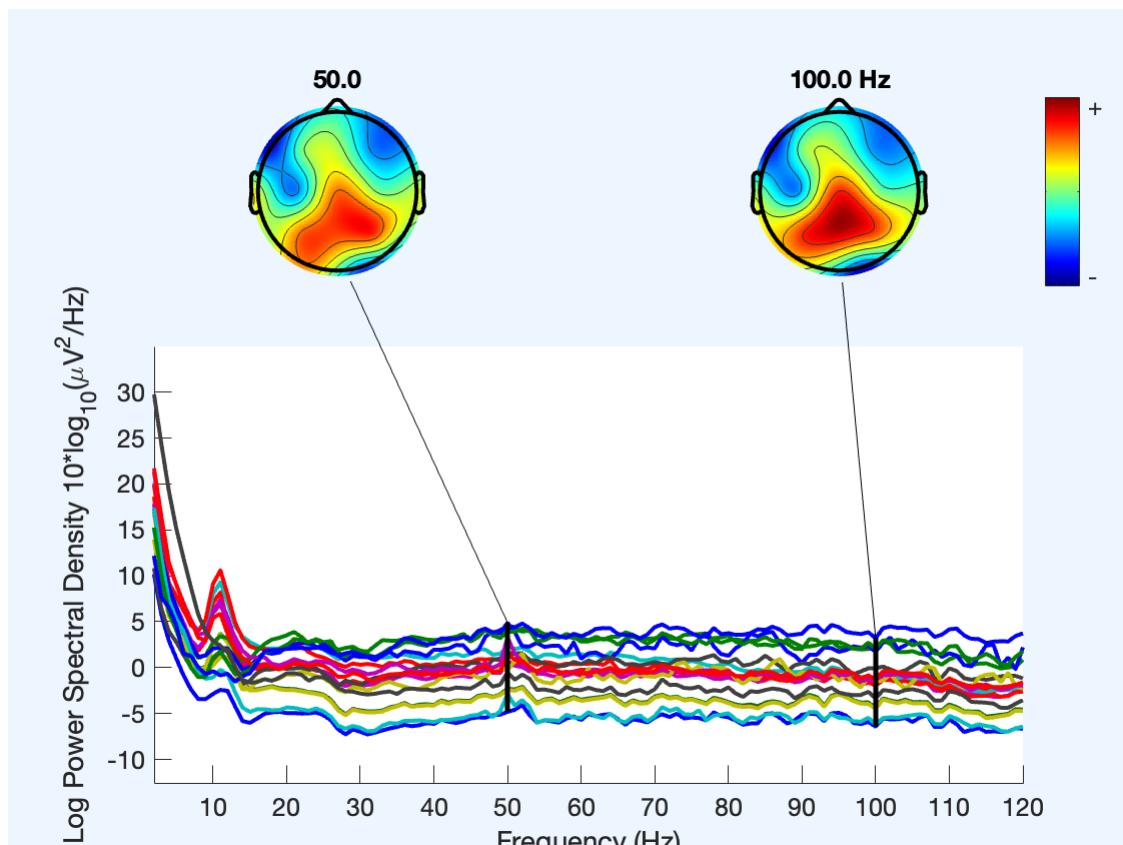
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

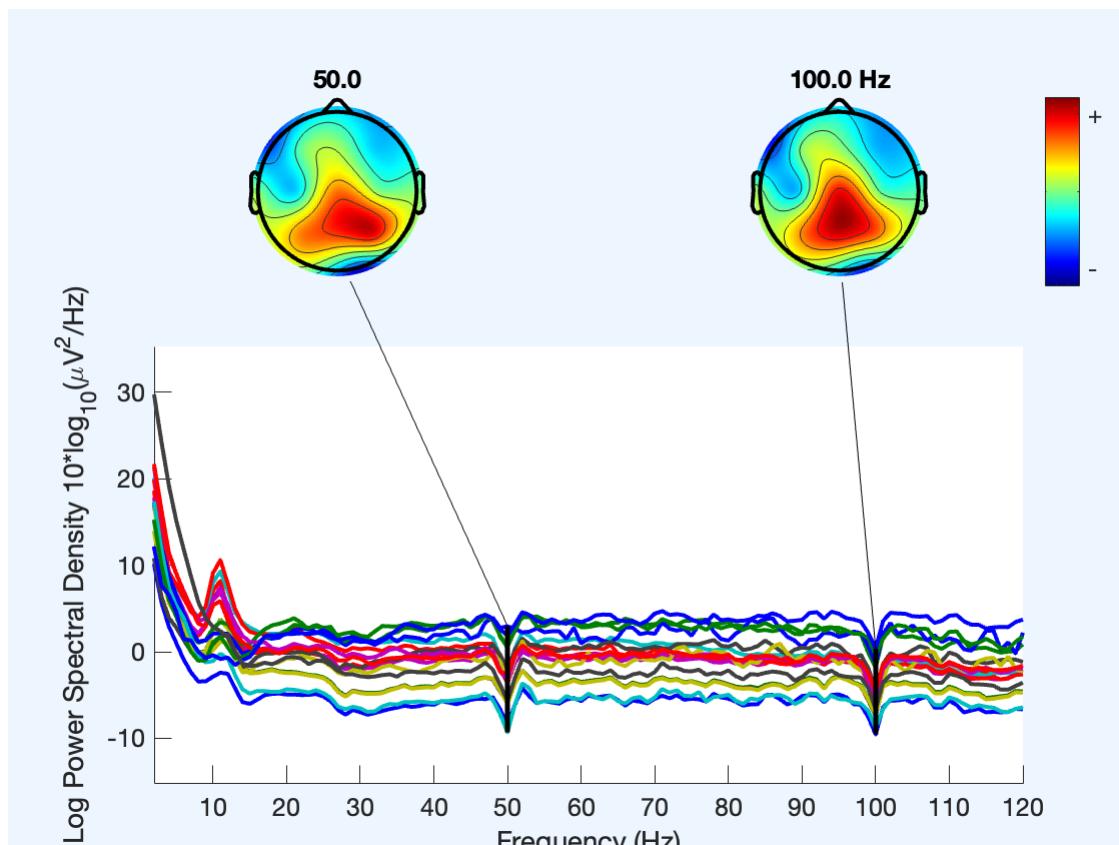
Plotting scalp distributions: ..

Click on each trace for channel/component index



Running cleanLineNoise (new version of cleanline)...
 Pop_spectopo: finding data discontinuities
 Computing spectra (window length 500; fft length: 500; overlap 0):

 Plotting scalp distributions: ..
 Click on each trace for channel/component index
 resampling data 250.0000 Hz
 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
 resampling event latencies...
 resampling finished



Saving data for A24 with filename: A24_2_upevent_mark_PrepocD1.set
 Saving dataset...

Processing subject: A24 for folder 3

pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/3/A24_3_upevent_mark.set ...

Re-referencing data

pop_eegfiltnew() - performing 33001 point highpass filtering.

pop_eegfiltnew() - transition band width: 0.05 Hz

pop_eegfiltnew() - passband edge(s): 0.05 Hz

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)

firfilt(): |=====| 100%, ETE 00:00

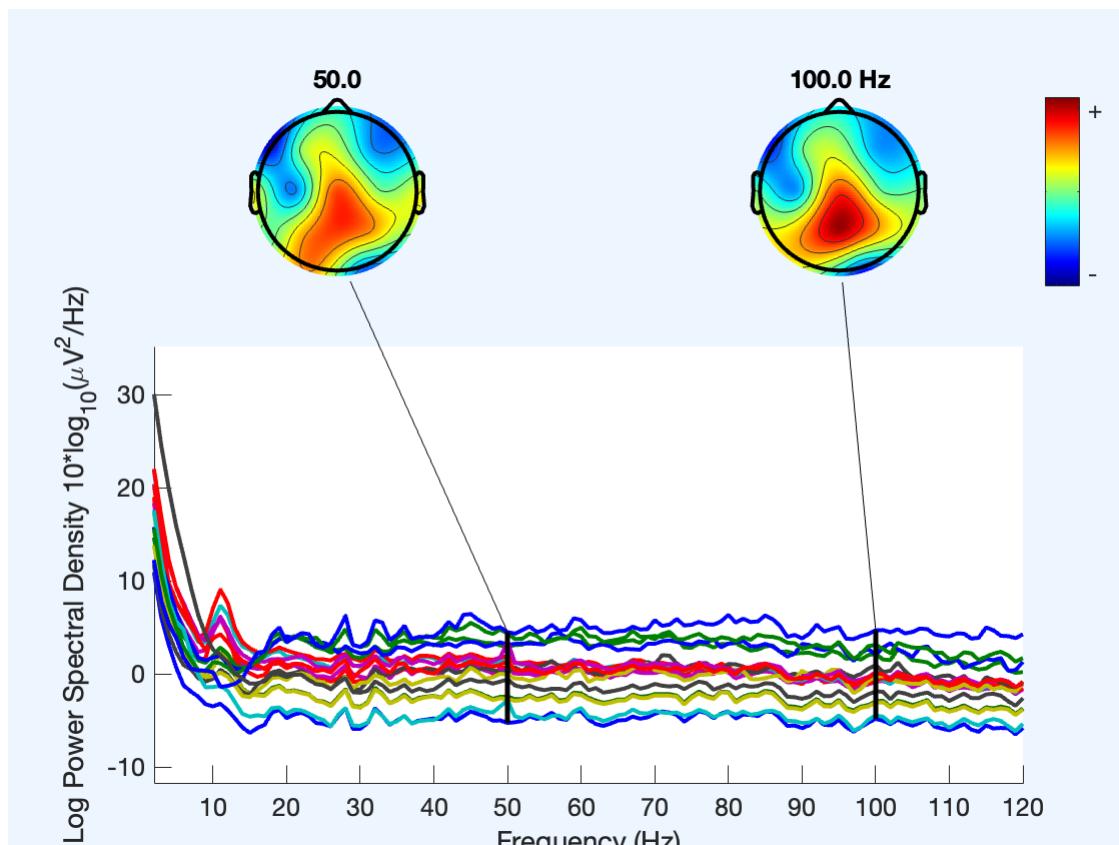
Pop_spectopo: finding data discontinuities

Computing spectra (window length 500; fft length: 500; overlap 0):

.....

Plotting scalp distributions: ..

Click on each trace for channel/component index



```

Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
16 17 18
resampling event latencies...
resampling finished
Saving data for A24 with filename: A24_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A27 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/1/A27_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index

```

```

resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A27 with filename: A27_1_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A27 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/2/A27_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A27 with filename: A27_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A27 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/3/A27_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A27 with filename: A27_3_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A28 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/1/A28_1_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz

```

```

pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13
14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A28 with filename: A28_1_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A28 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/2/A28_2_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
resampling event latencies...
resampling finished
Saving data for A28 with filename: A28_2_upevent_mark_PrepocD1.set
Saving dataset...
Processing subject: A28 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/3/A28_3_upevent_mark.set ...
Re-referencing data
pop_eegfiltnew() - performing 33001 point highpass filtering.
pop_eegfiltnew() - transition band width: 0.05 Hz
pop_eegfiltnew() - passband edge(s): 0.05 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 0.025 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
Running cleanLineNoise (new version of cleanline)...
Pop_spectopo: finding data discontinuities
Computing spectra (window length 500; fft length: 500; overlap 0):
.....
```

```

.....
Plotting scalp distributions: ..
Click on each trace for channel/component index
resampling data 250.0000 Hz
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18
resampling event latencies...
resampling finished
Saving data for A28 with filename: A28_3_upevent_mark_PrepocD1.set
Saving dataset...

```

Phase 2: Preprocessing Pre-Epoching: ICA on files together

We want the same ICA components for all conditions, so we're going to concatenate the conditions here to run ICA.

Loop through each subject and set the directory out folder to be one level higher

```

for s = 1:length(subjNames)
    subjName = subjNames{s};
    temp_subj_folder_joint = fullfile(options.data_dir,subjName);
    temp_filename_out =
    strcat(subjName,'_',options.filename_base,'_',options.prefixPhase1,'_',options.prefixPhase2,options.preprocessingTag,'All.set');

```

Check to see if the file already exists to determine if you should skip this subject.

```

if ~options.overwritePreprocFiles &&
exist(fullfile(temp_subj_folder,temp_filename_out),'file') > 0
    fprintf("File already exists... skipping... \n")
    continue
end

```

Load the data for each numBack

```

for n = numBack
    fprintf("Processing subject: %s for folder %s \n",subjName,
num2str(n))
    temp_subj_folder = fullfile(options.data_dir,subjName,num2str(n));
    temp_filename_in =
    strcat(subjName,'_',num2str(n),'_',options.filename_base,'_',options.prefixPhase1,'_',options.prefixPhase2,options.preprocessingTag,'1.set');

    try
        % Load data set
        EEG =
pop_loadset('filename',temp_filename_in,'filepath',temp_subj_folder);

        % Trim to one second before and after markers
        EEG = pop_select(EEG,'point', [(EEG.event(1).latency -
EEG.srate) (EEG.event(end).latency + EEG.srate)]);
        % Save to a named EEG# file for concatenation

```

```

        eval(strcat("EEG",num2str(n), " = EEG;"));
    catch SE
        input(strcat("Error loading dataset for ", subjName))
        SE
    end
end

```

Concatenate the data

```

for n = numBack

    % For the first element, set this to EEG
    if n == numBack(1)
        eval(strcat("EEG = EEG",num2str(n),";"));
    else
        % Otherwise merge with the first set
        eval(strcat("EEG = pop_mergeset(EEG,EEG",num2str(n),",0);"));
    end
end
EEG.subject = subjName;

```

Preprocess the data: step 2 (ICA and remove bad)

```
EEG = preprocessNBackEEG(EEG, 'D2', options);
```

Save data

```

fprintf(strcat("Saving data for ", subjName, " with filename: " ,
temp_filename_out, "\n"))
EEG =
pop_saveset(EEG, 'filename', temp_filename_out, 'filepath', temp_subj_folder_joi
nt);
end

```

```

Processing subject: A02 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/1/A02_1_upevent_mark_ProprocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A02 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/2/A02_2_upevent_mark_ProprocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A02 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A02/3/A02_3_upevent_mark_ProprocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform

```

```

Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02816
iteration 2, gradient norm = 0.0212
iteration 3, gradient norm = 0.01503
iteration 4, gradient norm = 0.01127
iteration 5, gradient norm = 0.01472
iteration 6, gradient norm = 0.007889
iteration 7, gradient norm = 0.006304
iteration 8, gradient norm = 0.003081
iteration 9, gradient norm = 0.004149
iteration 10, gradient norm = 0.008786
iteration 11, gradient norm = 0.01275
iteration 12, gradient norm = 0.01297
iteration 13, gradient norm = 0.007943
iteration 14, gradient norm = 0.006742
iteration 15, gradient norm = 0.006693
iteration 16, gradient norm = 0.005863
iteration 17, gradient norm = 0.005459
iteration 18, gradient norm = 0.004557
iteration 19, gradient norm = 0.004135
iteration 20, gradient norm = 0.002934
iteration 21, gradient norm = 0.001507
iteration 22, gradient norm = 0.00072
iteration 23, gradient norm = 0.0004161
iteration 24, gradient norm = 0.0003073
iteration 25, gradient norm = 0.0002002
iteration 26, gradient norm = 0.0001107
iteration 27, gradient norm = 5.288e-05
iteration 28, gradient norm = 3.317e-05
iteration 29, gradient norm = 2.92e-05
iteration 30, gradient norm = 2.683e-05
iteration 31, gradient norm = 2.405e-05
iteration 32, gradient norm = 2.098e-05
iteration 33, gradient norm = 1.773e-05
iteration 34, gradient norm = 1.439e-05
iteration 35, gradient norm = 1.097e-05
iteration 36, gradient norm = 7.574e-06
iteration 37, gradient norm = 4.585e-06
iteration 38, gradient norm = 3.159e-06
iteration 39, gradient norm = 2.346e-06
iteration 40, gradient norm = 1.717e-06
iteration 41, gradient norm = 1.427e-06
iteration 42, gradient norm = 1.141e-06
iteration 43, gradient norm = 8.893e-07
iteration 44, gradient norm = 6.392e-07

```

```
iteration 45, gradient norm = 3.94e-07
iteration 46, gradient norm = 2.133e-07
iteration 47, gradient norm = 1.218e-07
iteration 48, gradient norm = 8.119e-08
iteration 49, gradient norm = 5.445e-08
iteration 50, gradient norm = 3.12e-08
iteration 51, gradient norm = 1.698e-08
iteration 52, gradient norm = 1.447e-08
iteration 53, gradient norm = 1.231e-08
iteration 54, gradient norm = 1.034e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 1 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
clean_channel: 34/270 blocks, 0.0 minutes remaining.
clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 235/270 blocks, 0.0 minutes remaining.
clean_channel: 236/270 blocks, 0.0 minutes remaining.
clean_channel: 237/270 blocks, 0.0 minutes remaining.
clean_channel: 238/270 blocks, 0.0 minutes remaining.
clean_channel: 239/270 blocks, 0.0 minutes remaining.
clean_channel: 240/270 blocks, 0.0 minutes remaining.
clean_channel: 241/270 blocks, 0.0 minutes remaining.
clean_channel: 242/270 blocks, 0.0 minutes remaining.
clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 68.6% (927 seconds) of the data.
eeg_insertbound(): 194 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 4 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 99.2% (1335 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
```

```
eeg_insertbound(): 8 boundary (break) events added.  
eeg_insertbound(): boundary events inserted and 1 events removed.  
Scaling components to RMS microvolt  
eeg_checkset: recomputing the ICA activation matrix ...  
eeg_checkset note: event field format 'binlabel' made uniform  
eeg_checkset note: event field format 'codelabel' made uniform  
Event resorted by increasing latencies.  
Event resorted by increasing latencies.  
Use vis_artifacts to compare the cleaned data to the original.  
Done.  
Keeping this many channels:  
17  
Interpolating 2 channels...  
Warning: some channels have the same label  
Re-referencing data  
Removing 2 channel(s)...  
Event resorted by increasing latencies.  
Re-referencing ICA matrix  
  
Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).  
Decomposition saved as entry 1.  
Attempting to convert data matrix to double precision for more accurate ICA results.  
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M  
iteration 1, gradient norm = 0.01244  
iteration 2, gradient norm = 0.01371  
iteration 3, gradient norm = 0.01362  
iteration 4, gradient norm = 0.01634  
iteration 5, gradient norm = 0.02351  
iteration 6, gradient norm = 0.0183  
iteration 7, gradient norm = 0.01114  
iteration 8, gradient norm = 0.009424  
iteration 9, gradient norm = 0.008  
iteration 10, gradient norm = 0.002858  
iteration 11, gradient norm = 0.002249  
iteration 12, gradient norm = 0.0006848  
iteration 13, gradient norm = 0.0007061  
iteration 14, gradient norm = 0.0006555  
iteration 15, gradient norm = 0.0007484  
iteration 16, gradient norm = 0.000512  
iteration 17, gradient norm = 0.000444  
iteration 18, gradient norm = 0.000403  
iteration 19, gradient norm = 0.0003934  
iteration 20, gradient norm = 0.0004062  
iteration 21, gradient norm = 0.0004169  
iteration 22, gradient norm = 0.0004953  
iteration 23, gradient norm = 0.0003525  
iteration 24, gradient norm = 0.0001245  
iteration 25, gradient norm = 0.0001039  
iteration 26, gradient norm = 6.803e-05  
iteration 27, gradient norm = 4.825e-05  
iteration 28, gradient norm = 4.279e-05  
iteration 29, gradient norm = 2.449e-05  
iteration 30, gradient norm = 1.779e-05  
iteration 31, gradient norm = 1.221e-05  
iteration 32, gradient norm = 9.342e-06  
iteration 33, gradient norm = 4.78e-06  
iteration 34, gradient norm = 2.217e-06  
iteration 35, gradient norm = 2.079e-06  
iteration 36, gradient norm = 1.756e-06  
iteration 37, gradient norm = 1.478e-06  
iteration 38, gradient norm = 1.306e-06  
iteration 39, gradient norm = 1.212e-06  
iteration 40, gradient norm = 1.118e-06  
iteration 41, gradient norm = 9.748e-07
```

```

iteration 42, gradient norm = 8.616e-07
iteration 43, gradient norm = 7.256e-07
iteration 44, gradient norm = 6.574e-07
iteration 45, gradient norm = 4.776e-07
iteration 46, gradient norm = 4.525e-07
iteration 47, gradient norm = 2.411e-07
iteration 48, gradient norm = 1.377e-07
iteration 49, gradient norm = 6.743e-08
iteration 50, gradient norm = 5.098e-08
iteration 51, gradient norm = 3.307e-08
iteration 52, gradient norm = 2.108e-08
iteration 53, gradient norm = 1.487e-08
iteration 54, gradient norm = 1.42e-08
iteration 55, gradient norm = 1.053e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A02 with filename: A02_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A04 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/1/A04_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A04 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/2/A04_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A04 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A04/3/A04_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz

```

```

pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02405
iteration 2, gradient norm = 0.01634
iteration 3, gradient norm = 0.02066
iteration 4, gradient norm = 0.006707
iteration 5, gradient norm = 0.004903
iteration 6, gradient norm = 0.00212
iteration 7, gradient norm = 0.001944
iteration 8, gradient norm = 0.001641
iteration 9, gradient norm = 0.001234
iteration 10, gradient norm = 0.001503
iteration 11, gradient norm = 0.001783
iteration 12, gradient norm = 0.001924
iteration 13, gradient norm = 0.001528
iteration 14, gradient norm = 0.0009606
iteration 15, gradient norm = 0.0005724
iteration 16, gradient norm = 0.0003475
iteration 17, gradient norm = 0.0001755
iteration 18, gradient norm = 0.0001288
iteration 19, gradient norm = 7.752e-05
iteration 20, gradient norm = 5.348e-05
iteration 21, gradient norm = 3.103e-05
iteration 22, gradient norm = 2.018e-05
iteration 23, gradient norm = 1.844e-05
iteration 24, gradient norm = 1.429e-05
iteration 25, gradient norm = 9.176e-06
iteration 26, gradient norm = 6.509e-06
iteration 27, gradient norm = 3.9e-06
iteration 28, gradient norm = 2.405e-06
iteration 29, gradient norm = 2.465e-06
iteration 30, gradient norm = 2.277e-06
iteration 31, gradient norm = 1.873e-06
iteration 32, gradient norm = 1.342e-06
iteration 33, gradient norm = 1.598e-06
iteration 34, gradient norm = 1.932e-06
iteration 35, gradient norm = 1.745e-06
iteration 36, gradient norm = 1.109e-06
iteration 37, gradient norm = 9.17e-07
iteration 38, gradient norm = 7.927e-07
iteration 39, gradient norm = 5.999e-07
iteration 40, gradient norm = 3.708e-07
iteration 41, gradient norm = 2.299e-07
iteration 42, gradient norm = 1.032e-07
iteration 43, gradient norm = 6.737e-08
iteration 44, gradient norm = 4.925e-08
iteration 45, gradient norm = 4.186e-08
iteration 46, gradient norm = 3.855e-08
iteration 47, gradient norm = 2.32e-08
iteration 48, gradient norm = 1.199e-08
iteration 49, gradient norm = 1.303e-08
iteration 50, gradient norm = 1.53e-08
iteration 51, gradient norm = 1.537e-08
iteration 52, gradient norm = 1.332e-08
iteration 53, gradient norm = 1.092e-08
iteration 54, gradient norm = 1.065e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
```

```
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
5 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 5 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
clean_channel: 34/270 blocks, 0.0 minutes remaining.
clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
clean_channel: 45/270 blocks, 0.0 minutes remaining.
clean_channel: 46/270 blocks, 0.0 minutes remaining.
clean_channel: 47/270 blocks, 0.0 minutes remaining.
clean_channel: 48/270 blocks, 0.0 minutes remaining.
clean_channel: 49/270 blocks, 0.0 minutes remaining.
clean_channel: 50/270 blocks, 0.0 minutes remaining.
clean_channel: 51/270 blocks, 0.0 minutes remaining.
clean_channel: 52/270 blocks, 0.0 minutes remaining.
clean_channel: 53/270 blocks, 0.0 minutes remaining.
clean_channel: 54/270 blocks, 0.0 minutes remaining.
clean_channel: 55/270 blocks, 0.0 minutes remaining.
clean_channel: 56/270 blocks, 0.0 minutes remaining.
clean_channel: 57/270 blocks, 0.0 minutes remaining.
clean_channel: 58/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 57.5% (778 seconds) of the data.
eeg_insertbound(): 207 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
Event resorted by increasing latencies.
Now doing final post-clean up of the output.
Determining time window rejection thresholds...done.
Keeping 99.9% (1351 seconds) of the data.
eeg_insertbound(): 1 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
```

Warning: fixing rank computation inconsistency (17 vs 13) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.01655
iteration 2, gradient norm = 0.01181
iteration 3, gradient norm = 0.01131
iteration 4, gradient norm = 0.006948
iteration 5, gradient norm = 0.005595
iteration 6, gradient norm = 0.004958
iteration 7, gradient norm = 0.005932
iteration 8, gradient norm = 0.005019
iteration 9, gradient norm = 0.003767
iteration 10, gradient norm = 0.00276
iteration 11, gradient norm = 0.002023
iteration 12, gradient norm = 0.001168
iteration 13, gradient norm = 0.0007813
iteration 14, gradient norm = 0.0007378
iteration 15, gradient norm = 0.0006746
iteration 16, gradient norm = 0.0007084
iteration 17, gradient norm = 0.0009062
iteration 18, gradient norm = 0.0006681
iteration 19, gradient norm = 0.0004403
iteration 20, gradient norm = 0.0003342
iteration 21, gradient norm = 0.0003736
iteration 22, gradient norm = 0.0003542
iteration 23, gradient norm = 0.000289
iteration 24, gradient norm = 0.0002835
iteration 25, gradient norm = 0.0002527
iteration 26, gradient norm = 0.0001655
iteration 27, gradient norm = 0.0001269
iteration 28, gradient norm = 8.374e-05
iteration 29, gradient norm = 6.54e-05
iteration 30, gradient norm = 4.94e-05
iteration 31, gradient norm = 5.166e-05
iteration 32, gradient norm = 4.982e-05
iteration 33, gradient norm = 4.389e-05
iteration 34, gradient norm = 3.397e-05
iteration 35, gradient norm = 2.127e-05
iteration 36, gradient norm = 2.254e-05
iteration 37, gradient norm = 2.386e-05
iteration 38, gradient norm = 2.092e-05
iteration 39, gradient norm = 1.317e-05
iteration 40, gradient norm = 8.617e-06
iteration 41, gradient norm = 8.74e-06
iteration 42, gradient norm = 8.748e-06
iteration 43, gradient norm = 7.328e-06
iteration 44, gradient norm = 5.354e-06
iteration 45, gradient norm = 4.964e-06
iteration 46, gradient norm = 5.13e-06
iteration 47, gradient norm = 4.328e-06
iteration 48, gradient norm = 3.233e-06
iteration 49, gradient norm = 3.003e-06
iteration 50, gradient norm = 2.761e-06
iteration 51, gradient norm = 2.16e-06
iteration 52, gradient norm = 1.715e-06
iteration 53, gradient norm = 1.338e-06
iteration 54, gradient norm = 1.071e-06
iteration 55, gradient norm = 9.206e-07
iteration 56, gradient norm = 7.596e-07
iteration 57, gradient norm = 6.121e-07
iteration 58, gradient norm = 5.29e-07
iteration 59, gradient norm = 5.48e-07
iteration 60, gradient norm = 4.678e-07
iteration 61, gradient norm = 5.262e-07
iteration 62, gradient norm = 4.137e-07
iteration 63, gradient norm = 3.896e-07

```

iteration 64, gradient norm = 3.574e-07
iteration 65, gradient norm = 2.487e-07
iteration 66, gradient norm = 1.366e-07
iteration 67, gradient norm = 1.58e-07
iteration 68, gradient norm = 1.378e-07
iteration 69, gradient norm = 1.476e-07
iteration 70, gradient norm = 1.454e-07
iteration 71, gradient norm = 1.019e-07
iteration 72, gradient norm = 9.066e-08
iteration 73, gradient norm = 8.748e-08
iteration 74, gradient norm = 7.488e-08
iteration 75, gradient norm = 7.166e-08
iteration 76, gradient norm = 3.725e-08
iteration 77, gradient norm = 3.377e-08
iteration 78, gradient norm = 2.795e-08
iteration 79, gradient norm = 2.083e-08
iteration 80, gradient norm = 1.205e-08
iteration 81, gradient norm = 1.051e-08
iteration 82, gradient norm = 1.003e-08
iteration 83, gradient norm = 1.193e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A04 with filename: A04_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A05 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/1/A05_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A05 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/2/A05_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A05 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A05/3/A05_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform

```

```
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
```

```
Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.01805
iteration 2, gradient norm = 0.01737
iteration 3, gradient norm = 0.01548
iteration 4, gradient norm = 0.01559
iteration 5, gradient norm = 0.01137
iteration 6, gradient norm = 0.01113
iteration 7, gradient norm = 0.01236
iteration 8, gradient norm = 0.01288
iteration 9, gradient norm = 0.01
iteration 10, gradient norm = 0.009355
iteration 11, gradient norm = 0.008809
iteration 12, gradient norm = 0.005159
iteration 13, gradient norm = 0.003764
iteration 14, gradient norm = 0.003298
iteration 15, gradient norm = 0.001384
iteration 16, gradient norm = 0.001265
iteration 17, gradient norm = 0.0009486
iteration 18, gradient norm = 0.0004903
iteration 19, gradient norm = 0.0003307
iteration 20, gradient norm = 0.0002959
iteration 21, gradient norm = 0.0003198
iteration 22, gradient norm = 0.0002921
iteration 23, gradient norm = 0.0002007
iteration 24, gradient norm = 0.0001926
iteration 25, gradient norm = 0.0001221
iteration 26, gradient norm = 7.902e-05
iteration 27, gradient norm = 8.267e-05
iteration 28, gradient norm = 6.742e-05
iteration 29, gradient norm = 5.051e-05
iteration 30, gradient norm = 2.395e-05
iteration 31, gradient norm = 1.558e-05
iteration 32, gradient norm = 1.649e-05
iteration 33, gradient norm = 1.255e-05
iteration 34, gradient norm = 4.872e-06
iteration 35, gradient norm = 3.28e-06
iteration 36, gradient norm = 2.591e-06
iteration 37, gradient norm = 1.755e-06
iteration 38, gradient norm = 8.456e-07
iteration 39, gradient norm = 6.229e-07
iteration 40, gradient norm = 4.853e-07
iteration 41, gradient norm = 4.213e-07
iteration 42, gradient norm = 3.438e-07
iteration 43, gradient norm = 2.658e-07
iteration 44, gradient norm = 2.469e-07
iteration 45, gradient norm = 2.087e-07
iteration 46, gradient norm = 1.989e-07
iteration 47, gradient norm = 1.596e-07
iteration 48, gradient norm = 1.056e-07
iteration 49, gradient norm = 8.124e-08
iteration 50, gradient norm = 6.575e-08
iteration 51, gradient norm = 4.147e-08
iteration 52, gradient norm = 2.359e-08
iteration 53, gradient norm = 1.366e-08
iteration 54, gradient norm = 1.238e-08
```

```
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
2 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 2 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
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clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
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clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
clean_channel: 45/270 blocks, 0.0 minutes remaining.
clean_channel: 46/270 blocks, 0.0 minutes remaining.
clean_channel: 47/270 blocks, 0.0 minutes remaining.
clean_channel: 48/270 blocks, 0.0 minutes remaining.
clean_channel: 49/270 blocks, 0.0 minutes remaining.
clean_channel: 50/270 blocks, 0.0 minutes remaining.
clean_channel: 51/270 blocks, 0.0 minutes remaining.
clean_channel: 52/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 81.3% (1099 seconds) of the data.
eeg_insertbound(): 115 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 11 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 99.5% (1338 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
eeg_insertbound(): 5 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
```

```

Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
    Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.01539
iteration 2, gradient norm = 0.01538
iteration 3, gradient norm = 0.02088
iteration 4, gradient norm = 0.02329
iteration 5, gradient norm = 0.02163
iteration 6, gradient norm = 0.01173
iteration 7, gradient norm = 0.0109
iteration 8, gradient norm = 0.004472
iteration 9, gradient norm = 0.004101
iteration 10, gradient norm = 0.006588
iteration 11, gradient norm = 0.009114
iteration 12, gradient norm = 0.00868
iteration 13, gradient norm = 0.002811
iteration 14, gradient norm = 0.001864
iteration 15, gradient norm = 0.001669
iteration 16, gradient norm = 0.001382
iteration 17, gradient norm = 0.0009773
iteration 18, gradient norm = 0.0004332
iteration 19, gradient norm = 0.0003085
iteration 20, gradient norm = 0.0001794
iteration 21, gradient norm = 8.642e-05
iteration 22, gradient norm = 5.268e-05
iteration 23, gradient norm = 3.893e-05
iteration 24, gradient norm = 2.773e-05
iteration 25, gradient norm = 1.839e-05
iteration 26, gradient norm = 1.629e-05
iteration 27, gradient norm = 1.273e-05
iteration 28, gradient norm = 6.304e-06
iteration 29, gradient norm = 5.826e-06
iteration 30, gradient norm = 5.187e-06
iteration 31, gradient norm = 4.319e-06
iteration 32, gradient norm = 3.684e-06
iteration 33, gradient norm = 2.702e-06
iteration 34, gradient norm = 2.213e-06
iteration 35, gradient norm = 1.428e-06
iteration 36, gradient norm = 9.378e-07
iteration 37, gradient norm = 4.778e-07
iteration 38, gradient norm = 2.744e-07
iteration 39, gradient norm = 1.999e-07
iteration 40, gradient norm = 1.569e-07
iteration 41, gradient norm = 1.111e-07
iteration 42, gradient norm = 6.718e-08
iteration 43, gradient norm = 4.693e-08
iteration 44, gradient norm = 4.394e-08
iteration 45, gradient norm = 2.68e-08
iteration 46, gradient norm = 1.931e-08
iteration 47, gradient norm = 1.506e-08
iteration 48, gradient norm = 1.239e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...

```

```

ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A05 with filename: A05_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A07 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/1/A07_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A07 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/2/A07_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A07 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A07/3/A07_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02022
iteration 2, gradient norm = 0.01993
iteration 3, gradient norm = 0.01565
iteration 4, gradient norm = 0.005493
iteration 5, gradient norm = 0.003835
iteration 6, gradient norm = 0.005593
iteration 7, gradient norm = 0.006505
iteration 8, gradient norm = 0.006441
iteration 9, gradient norm = 0.004259
iteration 10, gradient norm = 0.004299
iteration 11, gradient norm = 0.004353
iteration 12, gradient norm = 0.004074
iteration 13, gradient norm = 0.002757

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iteration 14, gradient norm = 0.002529
iteration 15, gradient norm = 0.001779
iteration 16, gradient norm = 0.001191
iteration 17, gradient norm = 0.000501
iteration 18, gradient norm = 0.0003347
iteration 19, gradient norm = 0.0002364
iteration 20, gradient norm = 0.000243
iteration 21, gradient norm = 0.0002339
iteration 22, gradient norm = 0.0002689
iteration 23, gradient norm = 0.0002041
iteration 24, gradient norm = 0.0001112
iteration 25, gradient norm = 7.229e-05
iteration 26, gradient norm = 4.683e-05
iteration 27, gradient norm = 4.088e-05
iteration 28, gradient norm = 3.108e-05
iteration 29, gradient norm = 2.057e-05
iteration 30, gradient norm = 1.716e-05
iteration 31, gradient norm = 1.416e-05
iteration 32, gradient norm = 1.179e-05
iteration 33, gradient norm = 8.851e-06
iteration 34, gradient norm = 5.769e-06
iteration 35, gradient norm = 3.319e-06
iteration 36, gradient norm = 1.929e-06
iteration 37, gradient norm = 1.12e-06
iteration 38, gradient norm = 7.41e-07
iteration 39, gradient norm = 4.68e-07
iteration 40, gradient norm = 3.189e-07
iteration 41, gradient norm = 2.386e-07
iteration 42, gradient norm = 1.753e-07
iteration 43, gradient norm = 1.167e-07
iteration 44, gradient norm = 7.08e-08
iteration 45, gradient norm = 4.841e-08
iteration 46, gradient norm = 4.032e-08
iteration 47, gradient norm = 3.216e-08
iteration 48, gradient norm = 2.517e-08
iteration 49, gradient norm = 2.02e-08
iteration 50, gradient norm = 1.638e-08
iteration 51, gradient norm = 1.235e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
2 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 2 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.

```



```
Removing 2 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 83.1% (1122 seconds) of the data.
eeg_insertbound(): 77 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 85 blocks.....
eeg_insertbound(): 1 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 100.0% (1351 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
16
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
    Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (16 vs 15) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.01932
iteration 2, gradient norm = 0.0185
iteration 3, gradient norm = 0.02197
iteration 4, gradient norm = 0.007705
iteration 5, gradient norm = 0.006663
iteration 6, gradient norm = 0.005914
iteration 7, gradient norm = 0.001951
iteration 8, gradient norm = 0.001052
iteration 9, gradient norm = 0.001155
iteration 10, gradient norm = 0.001648
iteration 11, gradient norm = 0.001552
iteration 12, gradient norm = 0.001068
iteration 13, gradient norm = 0.0006023
iteration 14, gradient norm = 0.0003687
iteration 15, gradient norm = 0.0002388
iteration 16, gradient norm = 0.0001825
iteration 17, gradient norm = 0.0001344
iteration 18, gradient norm = 0.0001009
iteration 19, gradient norm = 6.176e-05
```

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iteration 20, gradient norm = 3.131e-05
iteration 21, gradient norm = 1.334e-05
iteration 22, gradient norm = 1.12e-05
iteration 23, gradient norm = 7.23e-06
iteration 24, gradient norm = 4.402e-06
iteration 25, gradient norm = 3.368e-06
iteration 26, gradient norm = 2.491e-06
iteration 27, gradient norm = 1.742e-06
iteration 28, gradient norm = 1.167e-06
iteration 29, gradient norm = 7.224e-07
iteration 30, gradient norm = 5.443e-07
iteration 31, gradient norm = 5.111e-07
iteration 32, gradient norm = 2.354e-07
iteration 33, gradient norm = 6.884e-08
iteration 34, gradient norm = 6.782e-08
iteration 35, gradient norm = 9.403e-08
iteration 36, gradient norm = 6.007e-08
iteration 37, gradient norm = 2.556e-08
iteration 38, gradient norm = 1.644e-08
iteration 39, gradient norm = 1.161e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A07 with filename: A07_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A08 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/1/A08_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A08 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/2/A08_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A08 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A08/3/A08_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform

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```
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
```

```
Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.01963
iteration 2, gradient norm = 0.02071
iteration 3, gradient norm = 0.01145
iteration 4, gradient norm = 0.01158
iteration 5, gradient norm = 0.006442
iteration 6, gradient norm = 0.003665
iteration 7, gradient norm = 0.0016
iteration 8, gradient norm = 0.00266
iteration 9, gradient norm = 0.003808
iteration 10, gradient norm = 0.007366
iteration 11, gradient norm = 0.004986
iteration 12, gradient norm = 0.004548
iteration 13, gradient norm = 0.00228
iteration 14, gradient norm = 0.001222
iteration 15, gradient norm = 0.0006971
iteration 16, gradient norm = 0.0005062
iteration 17, gradient norm = 0.0004012
iteration 18, gradient norm = 0.0003997
iteration 19, gradient norm = 0.0003942
iteration 20, gradient norm = 0.0003752
iteration 21, gradient norm = 0.0005876
iteration 22, gradient norm = 0.0005761
iteration 23, gradient norm = 0.0002785
iteration 24, gradient norm = 0.0001959
iteration 25, gradient norm = 0.0001841
iteration 26, gradient norm = 0.0001692
iteration 27, gradient norm = 0.000102
iteration 28, gradient norm = 8.106e-05
iteration 29, gradient norm = 6.442e-05
iteration 30, gradient norm = 5.044e-05
iteration 31, gradient norm = 3.734e-05
iteration 32, gradient norm = 2.668e-05
iteration 33, gradient norm = 1.749e-05
iteration 34, gradient norm = 1.481e-05
iteration 35, gradient norm = 5.964e-06
iteration 36, gradient norm = 4.542e-06
iteration 37, gradient norm = 4.027e-06
iteration 38, gradient norm = 3.117e-06
iteration 39, gradient norm = 1.336e-06
iteration 40, gradient norm = 7.698e-07
iteration 41, gradient norm = 1.066e-06
iteration 42, gradient norm = 8.192e-07
iteration 43, gradient norm = 3.883e-07
iteration 44, gradient norm = 3.296e-07
iteration 45, gradient norm = 4.332e-07
iteration 46, gradient norm = 3.139e-07
iteration 47, gradient norm = 1.712e-07
iteration 48, gradient norm = 1.462e-07
iteration 49, gradient norm = 1.681e-07
iteration 50, gradient norm = 1.123e-07
iteration 51, gradient norm = 5.339e-08
iteration 52, gradient norm = 3.534e-08
iteration 53, gradient norm = 3.567e-08
iteration 54, gradient norm = 1.734e-08
```

```
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 0 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.1 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
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clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
clean_channel: 45/270 blocks, 0.0 minutes remaining.
clean_channel: 46/270 blocks, 0.0 minutes remaining.
clean_channel: 47/270 blocks, 0.0 minutes remaining.
clean_channel: 48/270 blocks, 0.0 minutes remaining.
clean_channel: 49/270 blocks, 0.0 minutes remaining.
clean_channel: 50/270 blocks, 0.0 minutes remaining.
clean_channel: 51/270 blocks, 0.0 minutes remaining.
clean_channel: 52/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
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clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 3 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 33.7% (455 seconds) of the data.
eeg_insertbound(): 344 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 2 events removed.
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srat+1 = number of frames
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 75 blocks.....
eeg_insertbound(): 2 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 96.7% (1307 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
eeg_insertbound(): 32 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
```

```
Use vis_artifacts to compare the cleaned data to the original.  
Done.  
Keeping this many channels:  
15  
Interpolating 2 channels...  
Warning: some channels have the same label  
Re-referencing data  
Removing 2 channel(s)...  
Event resorted by increasing latencies.  
Re-referencing ICA matrix  
  
Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).  
Decomposition saved as entry 1.  
Attempting to convert data matrix to double precision for more accurate ICA results.  
Warning: fixing rank computation inconsistency (15 vs 14) most likely because running under Linux 64-bit M  
iteration 1, gradient norm = 0.009209  
iteration 2, gradient norm = 0.006998  
iteration 3, gradient norm = 0.01826  
iteration 4, gradient norm = 0.01735  
iteration 5, gradient norm = 0.02353  
iteration 6, gradient norm = 0.01728  
iteration 7, gradient norm = 0.006736  
iteration 8, gradient norm = 0.003788  
iteration 9, gradient norm = 0.003922  
iteration 10, gradient norm = 0.004493  
iteration 11, gradient norm = 0.00435  
iteration 12, gradient norm = 0.003975  
iteration 13, gradient norm = 0.002684  
iteration 14, gradient norm = 0.001477  
iteration 15, gradient norm = 0.001009  
iteration 16, gradient norm = 0.0007764  
iteration 17, gradient norm = 0.001125  
iteration 18, gradient norm = 0.001598  
iteration 19, gradient norm = 0.001695  
iteration 20, gradient norm = 0.0009334  
iteration 21, gradient norm = 0.0006188  
iteration 22, gradient norm = 0.0002343  
iteration 23, gradient norm = 0.0001781  
iteration 24, gradient norm = 0.0001327  
iteration 25, gradient norm = 8.059e-05  
iteration 26, gradient norm = 5.064e-05  
iteration 27, gradient norm = 4.501e-05  
iteration 28, gradient norm = 3.248e-05  
iteration 29, gradient norm = 1.806e-05  
iteration 30, gradient norm = 1.378e-05  
iteration 31, gradient norm = 1.741e-05  
iteration 32, gradient norm = 1.256e-05  
iteration 33, gradient norm = 5.449e-06  
iteration 34, gradient norm = 3.702e-06  
iteration 35, gradient norm = 6.138e-06  
iteration 36, gradient norm = 4.161e-06  
iteration 37, gradient norm = 1.276e-06  
iteration 38, gradient norm = 4.337e-07  
iteration 39, gradient norm = 6.088e-07  
iteration 40, gradient norm = 4.651e-07  
iteration 41, gradient norm = 1.838e-07  
iteration 42, gradient norm = 1.311e-07  
iteration 43, gradient norm = 1.281e-07  
iteration 44, gradient norm = 8.549e-08  
iteration 45, gradient norm = 6.2e-08  
iteration 46, gradient norm = 5.599e-08  
iteration 47, gradient norm = 5.746e-08  
iteration 48, gradient norm = 2.807e-08  
iteration 49, gradient norm = 1.896e-08
```

```

iteration 50, gradient norm = 1.267e-08
iteration 51, gradient norm = 1.454e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A08 with filename: A08_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A10 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A10/1/A10_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A10 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A10/2/A10_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A10 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A10/3/A10_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02294
iteration 2, gradient norm = 0.01789
iteration 3, gradient norm = 0.01125
iteration 4, gradient norm = 0.00469
iteration 5, gradient norm = 0.004016
iteration 6, gradient norm = 0.00157
iteration 7, gradient norm = 0.002003
iteration 8, gradient norm = 0.002657

```

```
iteration 9, gradient norm = 0.001724
iteration 10, gradient norm = 0.0007843
iteration 11, gradient norm = 0.0005571
iteration 12, gradient norm = 0.0005291
iteration 13, gradient norm = 0.0004921
iteration 14, gradient norm = 0.0004375
iteration 15, gradient norm = 0.0003644
iteration 16, gradient norm = 0.0002826
iteration 17, gradient norm = 0.0002119
iteration 18, gradient norm = 0.0002189
iteration 19, gradient norm = 0.0001742
iteration 20, gradient norm = 0.0001243
iteration 21, gradient norm = 8.624e-05
iteration 22, gradient norm = 0.0001153
iteration 23, gradient norm = 0.0001228
iteration 24, gradient norm = 0.0001204
iteration 25, gradient norm = 0.0001093
iteration 26, gradient norm = 8.605e-05
iteration 27, gradient norm = 6.95e-05
iteration 28, gradient norm = 4.688e-05
iteration 29, gradient norm = 2.714e-05
iteration 30, gradient norm = 1.954e-05
iteration 31, gradient norm = 1.846e-05
iteration 32, gradient norm = 1.652e-05
iteration 33, gradient norm = 1.301e-05
iteration 34, gradient norm = 8.255e-06
iteration 35, gradient norm = 3.924e-06
iteration 36, gradient norm = 3.055e-06
iteration 37, gradient norm = 2.635e-06
iteration 38, gradient norm = 1.849e-06
iteration 39, gradient norm = 1.315e-06
iteration 40, gradient norm = 1.049e-06
iteration 41, gradient norm = 1.368e-06
iteration 42, gradient norm = 1.267e-06
iteration 43, gradient norm = 1.22e-06
iteration 44, gradient norm = 1.105e-06
iteration 45, gradient norm = 9.576e-07
iteration 46, gradient norm = 8.11e-07
iteration 47, gradient norm = 6.93e-07
iteration 48, gradient norm = 6.099e-07
iteration 49, gradient norm = 5.42e-07
iteration 50, gradient norm = 4.649e-07
iteration 51, gradient norm = 3.646e-07
iteration 52, gradient norm = 2.469e-07
iteration 53, gradient norm = 1.354e-07
iteration 54, gradient norm = 7.765e-08
iteration 55, gradient norm = 4.752e-08
iteration 56, gradient norm = 4.16e-08
iteration 57, gradient norm = 2.684e-08
iteration 58, gradient norm = 2.257e-08
iteration 59, gradient norm = 2.402e-08
iteration 60, gradient norm = 3.446e-08
iteration 61, gradient norm = 2.915e-08
iteration 62, gradient norm = 2.261e-08
iteration 63, gradient norm = 2.113e-08
iteration 64, gradient norm = 1.915e-08
iteration 65, gradient norm = 1.739e-08
iteration 66, gradient norm = 1.576e-08
iteration 67, gradient norm = 1.388e-08
iteration 68, gradient norm = 1.154e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
```

```
Failed to run ICLabel. Trying to compile MEX-files.  
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v  
Warning: ICLLabel: defaulting to uncompiled matlab code (about 80x slower)  
ICLabel: saving results...  
4 components flagged for rejection, to reject them use Tools > Remove components from data  
Computing projection and removing 4 components ....  
Detecting flat line...  
Scanning for bad channels...  
clean_channel: 1/270 blocks, 0.1 minutes remaining.  
clean_channel: 2/270 blocks, 0.1 minutes remaining.  
clean_channel: 3/270 blocks, 0.1 minutes remaining.  
clean_channel: 4/270 blocks, 0.1 minutes remaining.  
clean_channel: 5/270 blocks, 0.1 minutes remaining.  
clean_channel: 6/270 blocks, 0.1 minutes remaining.  
clean_channel: 7/270 blocks, 0.1 minutes remaining.  
clean_channel: 8/270 blocks, 0.1 minutes remaining.  
clean_channel: 9/270 blocks, 0.1 minutes remaining.  
clean_channel: 10/270 blocks, 0.1 minutes remaining.  
clean_channel: 11/270 blocks, 0.1 minutes remaining.  
clean_channel: 12/270 blocks, 0.1 minutes remaining.  
clean_channel: 13/270 blocks, 0.1 minutes remaining.  
clean_channel: 14/270 blocks, 0.1 minutes remaining.  
clean_channel: 15/270 blocks, 0.1 minutes remaining.  
clean_channel: 16/270 blocks, 0.0 minutes remaining.  
clean_channel: 17/270 blocks, 0.0 minutes remaining.  
clean_channel: 18/270 blocks, 0.0 minutes remaining.  
clean_channel: 19/270 blocks, 0.0 minutes remaining.  
clean_channel: 20/270 blocks, 0.0 minutes remaining.  
clean_channel: 21/270 blocks, 0.0 minutes remaining.  
clean_channel: 22/270 blocks, 0.0 minutes remaining.  
clean_channel: 23/270 blocks, 0.0 minutes remaining.  
clean_channel: 24/270 blocks, 0.0 minutes remaining.  
clean_channel: 25/270 blocks, 0.0 minutes remaining.  
clean_channel: 26/270 blocks, 0.0 minutes remaining.  
clean_channel: 27/270 blocks, 0.0 minutes remaining.  
clean_channel: 28/270 blocks, 0.0 minutes remaining.  
clean_channel: 29/270 blocks, 0.0 minutes remaining.  
clean_channel: 30/270 blocks, 0.0 minutes remaining.  
clean_channel: 31/270 blocks, 0.0 minutes remaining.  
clean_channel: 32/270 blocks, 0.0 minutes remaining.  
clean_channel: 33/270 blocks, 0.0 minutes remaining.  
clean_channel: 34/270 blocks, 0.0 minutes remaining.  
clean_channel: 35/270 blocks, 0.0 minutes remaining.  
clean_channel: 36/270 blocks, 0.0 minutes remaining.  
clean_channel: 37/270 blocks, 0.0 minutes remaining.  
clean_channel: 38/270 blocks, 0.0 minutes remaining.  
clean_channel: 39/270 blocks, 0.0 minutes remaining.  
clean_channel: 40/270 blocks, 0.0 minutes remaining.  
clean_channel: 41/270 blocks, 0.0 minutes remaining.  
clean_channel: 42/270 blocks, 0.0 minutes remaining.  
clean_channel: 43/270 blocks, 0.0 minutes remaining.  
clean_channel: 44/270 blocks, 0.0 minutes remaining.  
clean_channel: 45/270 blocks, 0.0 minutes remaining.  
clean_channel: 46/270 blocks, 0.0 minutes remaining.  
clean_channel: 47/270 blocks, 0.0 minutes remaining.  
clean_channel: 48/270 blocks, 0.0 minutes remaining.  
clean_channel: 49/270 blocks, 0.0 minutes remaining.  
clean_channel: 50/270 blocks, 0.0 minutes remaining.  
clean_channel: 51/270 blocks, 0.0 minutes remaining.  
clean_channel: 52/270 blocks, 0.0 minutes remaining.  
clean_channel: 53/270 blocks, 0.0 minutes remaining.  
clean_channel: 54/270 blocks, 0.0 minutes remaining.  
clean_channel: 55/270 blocks, 0.0 minutes remaining.  
clean_channel: 56/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 85.4% (1155 seconds) of the data.
eeg_insertbound(): 123 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
Event resorted by increasing latencies.
Now doing final post-cleanups of the output.
Determining time window rejection thresholds...done.
Keeping 100.0% (1353 seconds) of the data.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 14) most likely because running under Linux 64-bit
iteration 1, gradient norm = 0.0124
iteration 2, gradient norm = 0.01007
iteration 3, gradient norm = 0.01602
iteration 4, gradient norm = 0.01211
iteration 5, gradient norm = 0.0196
```

```
iteration 6, gradient norm = 0.01857
iteration 7, gradient norm = 0.005763
iteration 8, gradient norm = 0.004825
iteration 9, gradient norm = 0.002257
iteration 10, gradient norm = 0.001268
iteration 11, gradient norm = 0.001059
iteration 12, gradient norm = 0.0008361
iteration 13, gradient norm = 0.0008797
iteration 14, gradient norm = 0.00157
iteration 15, gradient norm = 0.002015
iteration 16, gradient norm = 0.001707
iteration 17, gradient norm = 0.001517
iteration 18, gradient norm = 0.0008185
iteration 19, gradient norm = 0.0007124
iteration 20, gradient norm = 0.001332
iteration 21, gradient norm = 0.002346
iteration 22, gradient norm = 0.001761
iteration 23, gradient norm = 0.0005187
iteration 24, gradient norm = 0.0004462
iteration 25, gradient norm = 0.0003292
iteration 26, gradient norm = 0.0001926
iteration 27, gradient norm = 0.0001767
iteration 28, gradient norm = 0.0004635
iteration 29, gradient norm = 0.0005079
iteration 30, gradient norm = 0.0003303
iteration 31, gradient norm = 0.0002017
iteration 32, gradient norm = 0.0002472
iteration 33, gradient norm = 0.0002244
iteration 34, gradient norm = 0.0001834
iteration 35, gradient norm = 0.0001529
iteration 36, gradient norm = 0.000136
iteration 37, gradient norm = 0.0001142
iteration 38, gradient norm = 8.079e-05
iteration 39, gradient norm = 3.76e-05
iteration 40, gradient norm = 3.456e-05
iteration 41, gradient norm = 3.448e-05
iteration 42, gradient norm = 2.628e-05
iteration 43, gradient norm = 1.602e-05
iteration 44, gradient norm = 1.873e-05
iteration 45, gradient norm = 1.88e-05
iteration 46, gradient norm = 1.557e-05
iteration 47, gradient norm = 1.048e-05
iteration 48, gradient norm = 1.091e-05
iteration 49, gradient norm = 1.051e-05
iteration 50, gradient norm = 1.34e-05
iteration 51, gradient norm = 1.021e-05
iteration 52, gradient norm = 5.18e-06
iteration 53, gradient norm = 3.21e-06
iteration 54, gradient norm = 2.596e-06
iteration 55, gradient norm = 2.351e-06
iteration 56, gradient norm = 1.774e-06
iteration 57, gradient norm = 1.2e-06
iteration 58, gradient norm = 7.826e-07
iteration 59, gradient norm = 6.96e-07
iteration 60, gradient norm = 5.7e-07
iteration 61, gradient norm = 6.854e-07
iteration 62, gradient norm = 4.87e-07
iteration 63, gradient norm = 3.884e-07
iteration 64, gradient norm = 2.069e-07
iteration 65, gradient norm = 2.315e-07
iteration 66, gradient norm = 1.886e-07
iteration 67, gradient norm = 1.183e-07
iteration 68, gradient norm = 1.235e-07
iteration 69, gradient norm = 1.287e-07
```

```

iteration 70, gradient norm = 1.184e-07
iteration 71, gradient norm = 7.818e-08
iteration 72, gradient norm = 7.164e-08
iteration 73, gradient norm = 7.605e-08
iteration 74, gradient norm = 8.123e-08
iteration 75, gradient norm = 7.266e-08
iteration 76, gradient norm = 3.951e-08
iteration 77, gradient norm = 3.021e-08
iteration 78, gradient norm = 3.188e-08
iteration 79, gradient norm = 3.603e-08
iteration 80, gradient norm = 2.265e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.vi
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A10 with filename: A10_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A11 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/1/A11_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A11 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/2/A11_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A11 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A11/3/A11_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

```

```

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02474
iteration 2, gradient norm = 0.02154
iteration 3, gradient norm = 0.01549
iteration 4, gradient norm = 0.009791
iteration 5, gradient norm = 0.003526
iteration 6, gradient norm = 0.002542
iteration 7, gradient norm = 0.004599
iteration 8, gradient norm = 0.003948
iteration 9, gradient norm = 0.005963
iteration 10, gradient norm = 0.006421
iteration 11, gradient norm = 0.005579
iteration 12, gradient norm = 0.004918
iteration 13, gradient norm = 0.002726
iteration 14, gradient norm = 0.002996
iteration 15, gradient norm = 0.002963
iteration 16, gradient norm = 0.003451
iteration 17, gradient norm = 0.003024
iteration 18, gradient norm = 0.001966
iteration 19, gradient norm = 0.0007687
iteration 20, gradient norm = 0.0006626
iteration 21, gradient norm = 0.0004782
iteration 22, gradient norm = 0.000309
iteration 23, gradient norm = 0.000145
iteration 24, gradient norm = 8.698e-05
iteration 25, gradient norm = 5.718e-05
iteration 26, gradient norm = 3.214e-05
iteration 27, gradient norm = 2.379e-05
iteration 28, gradient norm = 1.49e-05
iteration 29, gradient norm = 9.91e-06
iteration 30, gradient norm = 5.952e-06
iteration 31, gradient norm = 6.726e-06
iteration 32, gradient norm = 3.582e-06
iteration 33, gradient norm = 3.464e-06
iteration 34, gradient norm = 2.912e-06
iteration 35, gradient norm = 2.678e-06
iteration 36, gradient norm = 1.604e-06
iteration 37, gradient norm = 1.219e-06
iteration 38, gradient norm = 8.873e-07
iteration 39, gradient norm = 6.201e-07
iteration 40, gradient norm = 4.159e-07
iteration 41, gradient norm = 2.631e-07
iteration 42, gradient norm = 1.478e-07
iteration 43, gradient norm = 1.061e-07
iteration 44, gradient norm = 3.808e-08
iteration 45, gradient norm = 1.93e-08
iteration 46, gradient norm = 2.019e-08
iteration 47, gradient norm = 1.648e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
5 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 5 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.

```



```
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 92.4% (1249 seconds) of the data.
eeg_insertbound(): 51 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
Event resorted by increasing latencies.
Now doing final post-clean up of the output.
Determining time window rejection thresholds...done.
Keeping 99.7% (1348 seconds) of the data.
eeg_insertbound(): 3 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 13) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.01762
iteration 2, gradient norm = 0.01364
iteration 3, gradient norm = 0.01005
iteration 4, gradient norm = 0.007154
iteration 5, gradient norm = 0.01196
iteration 6, gradient norm = 0.01273
iteration 7, gradient norm = 0.01291
iteration 8, gradient norm = 0.00782
iteration 9, gradient norm = 0.002626
iteration 10, gradient norm = 0.002418
```

```
iteration 11, gradient norm = 0.004926
iteration 12, gradient norm = 0.001749
iteration 13, gradient norm = 0.0008512
iteration 14, gradient norm = 0.0008802
iteration 15, gradient norm = 0.0008417
iteration 16, gradient norm = 0.0007429
iteration 17, gradient norm = 0.0007132
iteration 18, gradient norm = 0.0007922
iteration 19, gradient norm = 0.001047
iteration 20, gradient norm = 0.0004169
iteration 21, gradient norm = 0.0003965
iteration 22, gradient norm = 0.0003309
iteration 23, gradient norm = 0.0002449
iteration 24, gradient norm = 0.0002342
iteration 25, gradient norm = 0.0002442
iteration 26, gradient norm = 0.0002456
iteration 27, gradient norm = 0.0002783
iteration 28, gradient norm = 0.0003692
iteration 29, gradient norm = 0.0004309
iteration 30, gradient norm = 0.0004281
iteration 31, gradient norm = 0.0005212
iteration 32, gradient norm = 0.0003444
iteration 33, gradient norm = 0.0002205
iteration 34, gradient norm = 0.0001034
iteration 35, gradient norm = 8.565e-05
iteration 36, gradient norm = 5.432e-05
iteration 37, gradient norm = 3.23e-05
iteration 38, gradient norm = 2.128e-05
iteration 39, gradient norm = 1.782e-05
iteration 40, gradient norm = 1.179e-05
iteration 41, gradient norm = 6.831e-06
iteration 42, gradient norm = 6.653e-06
iteration 43, gradient norm = 6.013e-06
iteration 44, gradient norm = 5.621e-06
iteration 45, gradient norm = 5.466e-06
iteration 46, gradient norm = 3.916e-06
iteration 47, gradient norm = 2.249e-06
iteration 48, gradient norm = 1.461e-06
iteration 49, gradient norm = 1.414e-06
iteration 50, gradient norm = 1.341e-06
iteration 51, gradient norm = 1.194e-06
iteration 52, gradient norm = 1.181e-06
iteration 53, gradient norm = 1.589e-06
iteration 54, gradient norm = 1.81e-06
iteration 55, gradient norm = 1.6e-06
iteration 56, gradient norm = 9.848e-07
iteration 57, gradient norm = 5.002e-07
iteration 58, gradient norm = 4.935e-07
iteration 59, gradient norm = 4.242e-07
iteration 60, gradient norm = 3.498e-07
iteration 61, gradient norm = 3.852e-07
iteration 62, gradient norm = 3.244e-07
iteration 63, gradient norm = 2.227e-07
iteration 64, gradient norm = 1.184e-07
iteration 65, gradient norm = 7.842e-08
iteration 66, gradient norm = 5.631e-08
iteration 67, gradient norm = 4.563e-08
iteration 68, gradient norm = 3.999e-08
iteration 69, gradient norm = 3.004e-08
iteration 70, gradient norm = 2.551e-08
iteration 71, gradient norm = 2.826e-08
iteration 72, gradient norm = 2.618e-08
iteration 73, gradient norm = 2.587e-08
iteration 74, gradient norm = 2e-08
```

```

iteration 75, gradient norm = 1.776e-08
iteration 76, gradient norm = 1.368e-08
iteration 77, gradient norm = 1.102e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A11 with filename: A11_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A12 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/1/A12_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A12 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/2/A12_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A12 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A12/3/A12_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.0306
iteration 2, gradient norm = 0.02528
iteration 3, gradient norm = 0.02305
iteration 4, gradient norm = 0.008978
iteration 5, gradient norm = 0.01051
iteration 6, gradient norm = 0.02108
iteration 7, gradient norm = 0.03329

```

```
iteration 8, gradient norm = 0.02802
iteration 9, gradient norm = 0.03379
iteration 10, gradient norm = 0.01036
iteration 11, gradient norm = 0.006991
iteration 12, gradient norm = 0.004814
iteration 13, gradient norm = 0.003479
iteration 14, gradient norm = 0.003115
iteration 15, gradient norm = 0.00255
iteration 16, gradient norm = 0.002118
iteration 17, gradient norm = 0.001491
iteration 18, gradient norm = 0.001459
iteration 19, gradient norm = 0.001502
iteration 20, gradient norm = 0.001487
iteration 21, gradient norm = 0.001415
iteration 22, gradient norm = 0.001313
iteration 23, gradient norm = 0.001175
iteration 24, gradient norm = 0.001167
iteration 25, gradient norm = 0.001216
iteration 26, gradient norm = 0.001298
iteration 27, gradient norm = 0.00141
iteration 28, gradient norm = 0.001514
iteration 29, gradient norm = 0.00159
iteration 30, gradient norm = 0.001646
iteration 31, gradient norm = 0.001697
iteration 32, gradient norm = 0.001753
iteration 33, gradient norm = 0.001719
iteration 34, gradient norm = 0.001706
iteration 35, gradient norm = 0.00163
iteration 36, gradient norm = 0.001433
iteration 37, gradient norm = 0.001384
iteration 38, gradient norm = 0.001294
iteration 39, gradient norm = 0.001216
iteration 40, gradient norm = 0.00102
iteration 41, gradient norm = 0.0007471
iteration 42, gradient norm = 0.0004296
iteration 43, gradient norm = 0.00031
iteration 44, gradient norm = 0.0002659
iteration 45, gradient norm = 0.000231
iteration 46, gradient norm = 0.00022
iteration 47, gradient norm = 0.0002091
iteration 48, gradient norm = 0.0001939
iteration 49, gradient norm = 0.0001691
iteration 50, gradient norm = 0.0001381
iteration 51, gradient norm = 0.000112
iteration 52, gradient norm = 9.599e-05
iteration 53, gradient norm = 8.432e-05
iteration 54, gradient norm = 7.137e-05
iteration 55, gradient norm = 7.362e-05
iteration 56, gradient norm = 5.17e-05
iteration 57, gradient norm = 3.592e-05
iteration 58, gradient norm = 3.574e-05
iteration 59, gradient norm = 3.416e-05
iteration 60, gradient norm = 3.173e-05
iteration 61, gradient norm = 2.891e-05
iteration 62, gradient norm = 2.591e-05
iteration 63, gradient norm = 2.28e-05
iteration 64, gradient norm = 1.968e-05
iteration 65, gradient norm = 1.657e-05
iteration 66, gradient norm = 1.335e-05
iteration 67, gradient norm = 1.133e-05
iteration 68, gradient norm = 1.034e-05
iteration 69, gradient norm = 5.368e-06
iteration 70, gradient norm = 5e-06
iteration 71, gradient norm = 5.303e-06
```

```

iteration 72, gradient norm = 5.85e-06
iteration 73, gradient norm = 3.967e-06
iteration 74, gradient norm = 3.594e-06
iteration 75, gradient norm = 3.236e-06
iteration 76, gradient norm = 2.895e-06
iteration 77, gradient norm = 2.486e-06
iteration 78, gradient norm = 2.122e-06
iteration 79, gradient norm = 1.76e-06
iteration 80, gradient norm = 1.692e-06
iteration 81, gradient norm = 1.261e-06
iteration 82, gradient norm = 9.398e-07
iteration 83, gradient norm = 8.977e-07
iteration 84, gradient norm = 8.413e-07
iteration 85, gradient norm = 7.695e-07
iteration 86, gradient norm = 6.894e-07
iteration 87, gradient norm = 6.114e-07
iteration 88, gradient norm = 5.387e-07
iteration 89, gradient norm = 4.697e-07
iteration 90, gradient norm = 4.058e-07
iteration 91, gradient norm = 3.48e-07
iteration 92, gradient norm = 2.899e-07
iteration 93, gradient norm = 2.986e-07
iteration 94, gradient norm = 2.14e-07
iteration 95, gradient norm = 1.819e-07
iteration 96, gradient norm = 1.614e-07
iteration 97, gradient norm = 1.435e-07
iteration 98, gradient norm = 1.246e-07
iteration 99, gradient norm = 1.112e-07
iteration 100, gradient norm = 9.937e-08
iteration 101, gradient norm = 6.829e-08
iteration 102, gradient norm = 5.575e-08
iteration 103, gradient norm = 4.743e-08
iteration 104, gradient norm = 4.69e-08
iteration 105, gradient norm = 4.511e-08
iteration 106, gradient norm = 4.221e-08
iteration 107, gradient norm = 3.784e-08
iteration 108, gradient norm = 3.228e-08
iteration 109, gradient norm = 2.68e-08
iteration 110, gradient norm = 2.256e-08
iteration 111, gradient norm = 1.94e-08
iteration 112, gradient norm = 1.66e-08
iteration 113, gradient norm = 1.37e-08
iteration 114, gradient norm = 1.121e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
5 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 5 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.

```



```
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 26.7% (361 seconds) of the data.
eeg_insertbound(): 143 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 2 events removed.
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 155 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 96.1% (968 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
eeg_insertbound(): 25 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 29 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
    Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 13) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.03186
iteration 2, gradient norm = 0.02805
iteration 3, gradient norm = 0.03328
```

```
iteration 4, gradient norm = 0.0161
iteration 5, gradient norm = 0.01068
iteration 6, gradient norm = 0.009802
iteration 7, gradient norm = 0.008921
iteration 8, gradient norm = 0.009644
iteration 9, gradient norm = 0.007979
iteration 10, gradient norm = 0.008112
iteration 11, gradient norm = 0.004402
iteration 12, gradient norm = 0.002711
iteration 13, gradient norm = 0.00158
iteration 14, gradient norm = 0.0013
iteration 15, gradient norm = 0.0009704
iteration 16, gradient norm = 0.0007988
iteration 17, gradient norm = 0.000451
iteration 18, gradient norm = 0.0004612
iteration 19, gradient norm = 0.0004782
iteration 20, gradient norm = 0.0004391
iteration 21, gradient norm = 0.0003646
iteration 22, gradient norm = 0.000272
iteration 23, gradient norm = 0.0001551
iteration 24, gradient norm = 0.0001433
iteration 25, gradient norm = 0.0001159
iteration 26, gradient norm = 8.518e-05
iteration 27, gradient norm = 6.456e-05
iteration 28, gradient norm = 4.533e-05
iteration 29, gradient norm = 4.441e-05
iteration 30, gradient norm = 3.457e-05
iteration 31, gradient norm = 1.97e-05
iteration 32, gradient norm = 1.425e-05
iteration 33, gradient norm = 1.357e-05
iteration 34, gradient norm = 1.114e-05
iteration 35, gradient norm = 8.527e-06
iteration 36, gradient norm = 5.936e-06
iteration 37, gradient norm = 4.643e-06
iteration 38, gradient norm = 3.633e-06
iteration 39, gradient norm = 2.89e-06
iteration 40, gradient norm = 2.819e-06
iteration 41, gradient norm = 2.502e-06
iteration 42, gradient norm = 2.015e-06
iteration 43, gradient norm = 1.377e-06
iteration 44, gradient norm = 1.172e-06
iteration 45, gradient norm = 1.044e-06
iteration 46, gradient norm = 8.196e-07
iteration 47, gradient norm = 6.448e-07
iteration 48, gradient norm = 3.654e-07
iteration 49, gradient norm = 2.815e-07
iteration 50, gradient norm = 1.774e-07
iteration 51, gradient norm = 1.854e-07
iteration 52, gradient norm = 1.236e-07
iteration 53, gradient norm = 8.912e-08
iteration 54, gradient norm = 7.318e-08
iteration 55, gradient norm = 7.126e-08
iteration 56, gradient norm = 5.077e-08
iteration 57, gradient norm = 3.506e-08
iteration 58, gradient norm = 2.946e-08
iteration 59, gradient norm = 2.772e-08
iteration 60, gradient norm = 2.589e-08
iteration 61, gradient norm = 2.225e-08
iteration 62, gradient norm = 1.793e-08
iteration 63, gradient norm = 1.395e-08
iteration 64, gradient norm = 1.022e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
```

```

ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A12 with filename: A12_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A13 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A13/1/A13_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A13 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A13/2/A13_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A13 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A13/3/A13_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.03048
iteration 2, gradient norm = 0.02551
iteration 3, gradient norm = 0.02486
iteration 4, gradient norm = 0.008431
iteration 5, gradient norm = 0.005591
iteration 6, gradient norm = 0.003208
iteration 7, gradient norm = 0.001477
iteration 8, gradient norm = 0.001975
iteration 9, gradient norm = 0.003153
iteration 10, gradient norm = 0.005509
iteration 11, gradient norm = 0.004023
iteration 12, gradient norm = 0.002247
iteration 13, gradient norm = 0.002086

```

```

iteration 14, gradient norm = 0.001341
iteration 15, gradient norm = 0.0008057
iteration 16, gradient norm = 0.0005298
iteration 17, gradient norm = 0.0002929
iteration 18, gradient norm = 0.000171
iteration 19, gradient norm = 0.0001256
iteration 20, gradient norm = 7.052e-05
iteration 21, gradient norm = 6.466e-05
iteration 22, gradient norm = 4.815e-05
iteration 23, gradient norm = 3.988e-05
iteration 24, gradient norm = 2.578e-05
iteration 25, gradient norm = 1.832e-05
iteration 26, gradient norm = 1.163e-05
iteration 27, gradient norm = 6.67e-06
iteration 28, gradient norm = 3.586e-06
iteration 29, gradient norm = 1.901e-06
iteration 30, gradient norm = 1.065e-06
iteration 31, gradient norm = 6.444e-07
iteration 32, gradient norm = 3.72e-07
iteration 33, gradient norm = 2.267e-07
iteration 34, gradient norm = 2.023e-07
iteration 35, gradient norm = 1.454e-07
iteration 36, gradient norm = 8.27e-08
iteration 37, gradient norm = 5.762e-08
iteration 38, gradient norm = 4.831e-08
iteration 39, gradient norm = 3.545e-08
iteration 40, gradient norm = 2.361e-08
iteration 41, gradient norm = 1.458e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLLabel: extracting features...
ICLLabel: calculating labels...
Failed to run ICLLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLLabel: saving results...
4 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 4 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.

```



```
clean_channel: 217/270 blocks, 0.0 minutes remaining.  
clean_channel: 218/270 blocks, 0.0 minutes remaining.  
clean_channel: 219/270 blocks, 0.0 minutes remaining.  
clean_channel: 220/270 blocks, 0.0 minutes remaining.  
clean_channel: 221/270 blocks, 0.0 minutes remaining.  
clean_channel: 222/270 blocks, 0.0 minutes remaining.  
clean_channel: 223/270 blocks, 0.0 minutes remaining.  
clean_channel: 224/270 blocks, 0.0 minutes remaining.  
clean_channel: 225/270 blocks, 0.0 minutes remaining.  
clean_channel: 226/270 blocks, 0.0 minutes remaining.  
clean_channel: 227/270 blocks, 0.0 minutes remaining.  
clean_channel: 228/270 blocks, 0.0 minutes remaining.  
clean_channel: 229/270 blocks, 0.0 minutes remaining.  
clean_channel: 230/270 blocks, 0.0 minutes remaining.  
clean_channel: 231/270 blocks, 0.0 minutes remaining.  
clean_channel: 232/270 blocks, 0.0 minutes remaining.  
clean_channel: 233/270 blocks, 0.0 minutes remaining.  
clean_channel: 234/270 blocks, 0.0 minutes remaining.  
clean_channel: 235/270 blocks, 0.0 minutes remaining.  
clean_channel: 236/270 blocks, 0.0 minutes remaining.  
clean_channel: 237/270 blocks, 0.0 minutes remaining.  
clean_channel: 238/270 blocks, 0.0 minutes remaining.  
clean_channel: 239/270 blocks, 0.0 minutes remaining.  
clean_channel: 240/270 blocks, 0.0 minutes remaining.  
clean_channel: 241/270 blocks, 0.0 minutes remaining.  
clean_channel: 242/270 blocks, 0.0 minutes remaining.  
clean_channel: 243/270 blocks, 0.0 minutes remaining.  
clean_channel: 244/270 blocks, 0.0 minutes remaining.  
clean_channel: 245/270 blocks, 0.0 minutes remaining.  
clean_channel: 246/270 blocks, 0.0 minutes remaining.  
clean_channel: 247/270 blocks, 0.0 minutes remaining.  
clean_channel: 248/270 blocks, 0.0 minutes remaining.  
clean_channel: 249/270 blocks, 0.0 minutes remaining.  
clean_channel: 250/270 blocks, 0.0 minutes remaining.  
clean_channel: 251/270 blocks, 0.0 minutes remaining.  
clean_channel: 252/270 blocks, 0.0 minutes remaining.  
clean_channel: 253/270 blocks, 0.0 minutes remaining.  
clean_channel: 254/270 blocks, 0.0 minutes remaining.  
clean_channel: 255/270 blocks, 0.0 minutes remaining.  
clean_channel: 256/270 blocks, 0.0 minutes remaining.  
clean_channel: 257/270 blocks, 0.0 minutes remaining.  
clean_channel: 258/270 blocks, 0.0 minutes remaining.  
clean_channel: 259/270 blocks, 0.0 minutes remaining.  
clean_channel: 260/270 blocks, 0.0 minutes remaining.  
clean_channel: 261/270 blocks, 0.0 minutes remaining.  
clean_channel: 262/270 blocks, 0.0 minutes remaining.  
clean_channel: 263/270 blocks, 0.0 minutes remaining.  
clean_channel: 264/270 blocks, 0.0 minutes remaining.  
clean_channel: 265/270 blocks, 0.0 minutes remaining.  
clean_channel: 266/270 blocks, 0.0 minutes remaining.  
clean_channel: 267/270 blocks, 0.0 minutes remaining.  
clean_channel: 268/270 blocks, 0.0 minutes remaining.  
clean_channel: 269/270 blocks, 0.0 minutes remaining.  
clean_channel: 270/270 blocks, 0.0 minutes remaining.  
Removing 2 channel(s)...  
Scaling components to RMS microvolt  
eeg_checkset: recomputing the ICA activation matrix ...  
Event resorted by increasing latencies.  
Finding a clean section of the data...  
Determining time window rejection thresholds...done.  
Keeping 54.9% (742 seconds) of the data.  
eeg_insertbound(): 243 boundary (break) events added.  
Scaling components to RMS microvolt  
eeg_checkset: recomputing the ICA activation matrix ...
```

```
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 85 blocks.....
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 89.2% (1207 seconds) of the data.
eeg_insertbound(): 94 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
16
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)... .
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (16 vs 14) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.0227
iteration 2, gradient norm = 0.04036
iteration 3, gradient norm = 0.02744
iteration 4, gradient norm = 0.01816
iteration 5, gradient norm = 0.01053
iteration 6, gradient norm = 0.00931
iteration 7, gradient norm = 0.008102
iteration 8, gradient norm = 0.005119
iteration 9, gradient norm = 0.002853
iteration 10, gradient norm = 0.006437
iteration 11, gradient norm = 0.005434
iteration 12, gradient norm = 0.005366
iteration 13, gradient norm = 0.002984
iteration 14, gradient norm = 0.001635
iteration 15, gradient norm = 0.001421
iteration 16, gradient norm = 0.001139
iteration 17, gradient norm = 0.0008113
iteration 18, gradient norm = 0.0008797
iteration 19, gradient norm = 0.0008276
iteration 20, gradient norm = 0.0005732
iteration 21, gradient norm = 0.0003628
iteration 22, gradient norm = 0.0002029
iteration 23, gradient norm = 0.0001655
iteration 24, gradient norm = 0.0001737
iteration 25, gradient norm = 0.0001731
iteration 26, gradient norm = 0.0001747
iteration 27, gradient norm = 0.0001785
iteration 28, gradient norm = 0.0001865
iteration 29, gradient norm = 0.0002519
iteration 30, gradient norm = 0.0003423
```

```
iteration 31, gradient norm = 0.0003718
iteration 32, gradient norm = 0.0002544
iteration 33, gradient norm = 0.0002134
iteration 34, gradient norm = 0.0001846
iteration 35, gradient norm = 0.0001691
iteration 36, gradient norm = 0.0001613
iteration 37, gradient norm = 0.0001521
iteration 38, gradient norm = 0.0001238
iteration 39, gradient norm = 9.595e-05
iteration 40, gradient norm = 7.293e-05
iteration 41, gradient norm = 4.82e-05
iteration 42, gradient norm = 3.362e-05
iteration 43, gradient norm = 2.473e-05
iteration 44, gradient norm = 2.368e-05
iteration 45, gradient norm = 2.375e-05
iteration 46, gradient norm = 2.207e-05
iteration 47, gradient norm = 1.933e-05
iteration 48, gradient norm = 1.553e-05
iteration 49, gradient norm = 1.065e-05
iteration 50, gradient norm = 5.188e-06
iteration 51, gradient norm = 4.347e-06
iteration 52, gradient norm = 3.942e-06
iteration 53, gradient norm = 3.462e-06
iteration 54, gradient norm = 3.024e-06
iteration 55, gradient norm = 2.554e-06
iteration 56, gradient norm = 2.065e-06
iteration 57, gradient norm = 1.65e-06
iteration 58, gradient norm = 1.368e-06
iteration 59, gradient norm = 1.181e-06
iteration 60, gradient norm = 1.094e-06
iteration 61, gradient norm = 1.116e-06
iteration 62, gradient norm = 1.063e-06
iteration 63, gradient norm = 9.418e-07
iteration 64, gradient norm = 7.512e-07
iteration 65, gradient norm = 5.338e-07
iteration 66, gradient norm = 3.647e-07
iteration 67, gradient norm = 2.666e-07
iteration 68, gradient norm = 2.081e-07
iteration 69, gradient norm = 1.655e-07
iteration 70, gradient norm = 1.341e-07
iteration 71, gradient norm = 1.112e-07
iteration 72, gradient norm = 9.129e-08
iteration 73, gradient norm = 7.366e-08
iteration 74, gradient norm = 7.161e-08
iteration 75, gradient norm = 6.407e-08
iteration 76, gradient norm = 5.383e-08
iteration 77, gradient norm = 4.332e-08
iteration 78, gradient norm = 3.422e-08
iteration 79, gradient norm = 2.798e-08
iteration 80, gradient norm = 2.43e-08
iteration 81, gradient norm = 2.122e-08
iteration 82, gradient norm = 1.689e-08
iteration 83, gradient norm = 1.488e-08
iteration 84, gradient norm = 1.228e-08
iteration 85, gradient norm = 1.018e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
```

Saving data for A13 with filename: A13_upevent_mark_PrepocDAll.set
 Saving dataset...
 Processing subject: A14 for folder 1
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A14/1/A14_1_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Processing subject: A14 for folder 2
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A14/2/A14_2_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Processing subject: A14 for folder 3
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A14/3/A14_3_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Merging datasets...
 Warning: second dataset has empty urevent structure.
 Concatenating events...
 Adding boundary event...
 Reconstituting epoch information...
 eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Warning: duplicate boundary event removed
 Event resorted by increasing latencies.
 Merging datasets...
 Warning: second dataset has empty urevent structure.
 Concatenating events...
 Adding boundary event...
 Reconstituting epoch information...
 eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Warning: duplicate boundary event removed
 Event resorted by increasing latencies.
 pop_eegfiltnew() - performing 415 point highpass filtering.
 pop_eegfiltnew() - transition band width: 2 Hz
 pop_eegfiltnew() - passband edge(s): 2 Hz
 pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
 pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
 firfilt(): |=====| 100%, ETE 00:00

 Attempting to convert data matrix to double precision for more accurate ICA results.
 iteration 1, gradient norm = 0.03502
 iteration 2, gradient norm = 0.02581
 iteration 3, gradient norm = 0.006503
 iteration 4, gradient norm = 0.003893
 iteration 5, gradient norm = 0.006133
 iteration 6, gradient norm = 0.006603
 iteration 7, gradient norm = 0.005237
 iteration 8, gradient norm = 0.002028
 iteration 9, gradient norm = 0.0006201
 iteration 10, gradient norm = 0.0006601
 iteration 11, gradient norm = 0.0007091
 iteration 12, gradient norm = 0.0005288
 iteration 13, gradient norm = 0.0004787
 iteration 14, gradient norm = 0.0004273
 iteration 15, gradient norm = 0.0003868
 iteration 16, gradient norm = 0.0003591
 iteration 17, gradient norm = 0.0003012
 iteration 18, gradient norm = 0.0003147
 iteration 19, gradient norm = 0.0003141

```

iteration 20, gradient norm = 0.0003059
iteration 21, gradient norm = 0.0002857
iteration 22, gradient norm = 0.0002782
iteration 23, gradient norm = 0.0002399
iteration 24, gradient norm = 0.0002711
iteration 25, gradient norm = 0.000246
iteration 26, gradient norm = 0.0002498
iteration 27, gradient norm = 0.000226
iteration 28, gradient norm = 0.0001801
iteration 29, gradient norm = 0.0001288
iteration 30, gradient norm = 0.0001241
iteration 31, gradient norm = 9.827e-05
iteration 32, gradient norm = 6.829e-05
iteration 33, gradient norm = 5.895e-05
iteration 34, gradient norm = 6.025e-05
iteration 35, gradient norm = 6.146e-05
iteration 36, gradient norm = 0.0001135
iteration 37, gradient norm = 0.0001615
iteration 38, gradient norm = 0.0001473
iteration 39, gradient norm = 6.973e-05
iteration 40, gradient norm = 4.973e-05
iteration 41, gradient norm = 2.933e-05
iteration 42, gradient norm = 1.879e-05
iteration 43, gradient norm = 1.529e-05
iteration 44, gradient norm = 1.536e-05
iteration 45, gradient norm = 1.452e-05
iteration 46, gradient norm = 1.313e-05
iteration 47, gradient norm = 1.077e-05
iteration 48, gradient norm = 7.464e-06
iteration 49, gradient norm = 3.79e-06
iteration 50, gradient norm = 2.881e-06
iteration 51, gradient norm = 1.939e-06
iteration 52, gradient norm = 1.385e-06
iteration 53, gradient norm = 8.082e-07
iteration 54, gradient norm = 7.748e-07
iteration 55, gradient norm = 5.051e-07
iteration 56, gradient norm = 4.435e-07
iteration 57, gradient norm = 4.357e-07
iteration 58, gradient norm = 3.947e-07
iteration 59, gradient norm = 3.273e-07
iteration 60, gradient norm = 2.65e-07
iteration 61, gradient norm = 2.281e-07
iteration 62, gradient norm = 3.285e-07
iteration 63, gradient norm = 3.214e-07
iteration 64, gradient norm = 1.718e-07
iteration 65, gradient norm = 8.095e-08
iteration 66, gradient norm = 5.576e-08
iteration 67, gradient norm = 4.191e-08
iteration 68, gradient norm = 2.768e-08
iteration 69, gradient norm = 2.068e-08
iteration 70, gradient norm = 1.626e-08
iteration 71, gradient norm = 1.045e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 1 components ....
Detecting flat line...
Scanning for bad channels...

```



```
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 87.0% (1177 seconds) of the data.
eeg_insertbound(): 86 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
Event resorted by increasing latencies.
Now doing final post-cleanups of the output.
Determining time window rejection thresholds...done.
Keeping 98.9% (1337 seconds) of the data.
eeg_insertbound(): 12 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
    Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.01121
iteration 2, gradient norm = 0.013
iteration 3, gradient norm = 0.01201
iteration 4, gradient norm = 0.01004
iteration 5, gradient norm = 0.02218
iteration 6, gradient norm = 0.03151
iteration 7, gradient norm = 0.01918
```

```
iteration 8, gradient norm = 0.008302
iteration 9, gradient norm = 0.01668
iteration 10, gradient norm = 0.005608
iteration 11, gradient norm = 0.004081
iteration 12, gradient norm = 0.003284
iteration 13, gradient norm = 0.002172
iteration 14, gradient norm = 0.001522
iteration 15, gradient norm = 0.001291
iteration 16, gradient norm = 0.001642
iteration 17, gradient norm = 0.001072
iteration 18, gradient norm = 0.001052
iteration 19, gradient norm = 0.0009331
iteration 20, gradient norm = 0.0006353
iteration 21, gradient norm = 0.0004926
iteration 22, gradient norm = 0.0003323
iteration 23, gradient norm = 0.0002763
iteration 24, gradient norm = 0.0002295
iteration 25, gradient norm = 0.0002018
iteration 26, gradient norm = 0.0001932
iteration 27, gradient norm = 0.0003322
iteration 28, gradient norm = 0.0004643
iteration 29, gradient norm = 0.0003345
iteration 30, gradient norm = 0.0002671
iteration 31, gradient norm = 0.0001741
iteration 32, gradient norm = 0.0002152
iteration 33, gradient norm = 0.0001225
iteration 34, gradient norm = 9.688e-05
iteration 35, gradient norm = 9.817e-05
iteration 36, gradient norm = 9.513e-05
iteration 37, gradient norm = 3.575e-05
iteration 38, gradient norm = 2.105e-05
iteration 39, gradient norm = 2.004e-05
iteration 40, gradient norm = 1.636e-05
iteration 41, gradient norm = 1.436e-05
iteration 42, gradient norm = 1.343e-05
iteration 43, gradient norm = 1.305e-05
iteration 44, gradient norm = 1.287e-05
iteration 45, gradient norm = 1.389e-05
iteration 46, gradient norm = 1.283e-05
iteration 47, gradient norm = 1.073e-05
iteration 48, gradient norm = 7.08e-06
iteration 49, gradient norm = 5.021e-06
iteration 50, gradient norm = 4.912e-06
iteration 51, gradient norm = 2.687e-06
iteration 52, gradient norm = 1.76e-06
iteration 53, gradient norm = 9.83e-07
iteration 54, gradient norm = 7.325e-07
iteration 55, gradient norm = 5.497e-07
iteration 56, gradient norm = 4.606e-07
iteration 57, gradient norm = 6.013e-07
iteration 58, gradient norm = 4.827e-07
iteration 59, gradient norm = 2.469e-07
iteration 60, gradient norm = 1.553e-07
iteration 61, gradient norm = 1.595e-07
iteration 62, gradient norm = 1.589e-07
iteration 63, gradient norm = 1.493e-07
iteration 64, gradient norm = 1.473e-07
iteration 65, gradient norm = 2.02e-07
iteration 66, gradient norm = 1.667e-07
iteration 67, gradient norm = 1.506e-07
iteration 68, gradient norm = 9.375e-08
iteration 69, gradient norm = 7.921e-08
iteration 70, gradient norm = 5.233e-08
iteration 71, gradient norm = 3.07e-08
```

```

iteration 72, gradient norm = 2.649e-08
iteration 73, gradient norm = 2.862e-08
iteration 74, gradient norm = 1.69e-08
iteration 75, gradient norm = 1.028e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.vi
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A14 with filename: A14_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A15 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/1/A15_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A15 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/2/A15_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A15 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A15/3/A15_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.0125
iteration 2, gradient norm = 0.01189
iteration 3, gradient norm = 0.01635
iteration 4, gradient norm = 0.01568
iteration 5, gradient norm = 0.01619
iteration 6, gradient norm = 0.01831

```

```

iteration 7, gradient norm = 0.0194
iteration 8, gradient norm = 0.01942
iteration 9, gradient norm = 0.01454
iteration 10, gradient norm = 0.00986
iteration 11, gradient norm = 0.01414
iteration 12, gradient norm = 0.01131
iteration 13, gradient norm = 0.01253
iteration 14, gradient norm = 0.008012
iteration 15, gradient norm = 0.005214
iteration 16, gradient norm = 0.005266
iteration 17, gradient norm = 0.005391
iteration 18, gradient norm = 0.004436
iteration 19, gradient norm = 0.003406
iteration 20, gradient norm = 0.002121
iteration 21, gradient norm = 0.0005883
iteration 22, gradient norm = 0.0003569
iteration 23, gradient norm = 0.0001545
iteration 24, gradient norm = 0.0001007
iteration 25, gradient norm = 0.0001012
iteration 26, gradient norm = 7.226e-05
iteration 27, gradient norm = 2.794e-05
iteration 28, gradient norm = 9.183e-06
iteration 29, gradient norm = 4.377e-06
iteration 30, gradient norm = 3.508e-06
iteration 31, gradient norm = 2.473e-06
iteration 32, gradient norm = 1.505e-06
iteration 33, gradient norm = 9.81e-07
iteration 34, gradient norm = 7.114e-07
iteration 35, gradient norm = 2.566e-07
iteration 36, gradient norm = 1.601e-07
iteration 37, gradient norm = 1.56e-07
iteration 38, gradient norm = 1.412e-07
iteration 39, gradient norm = 1.201e-07
iteration 40, gradient norm = 1.004e-07
iteration 41, gradient norm = 8.427e-08
iteration 42, gradient norm = 6.967e-08
iteration 43, gradient norm = 5.513e-08
iteration 44, gradient norm = 4.189e-08
iteration 45, gradient norm = 3.159e-08
iteration 46, gradient norm = 2.414e-08
iteration 47, gradient norm = 1.808e-08
iteration 48, gradient norm = 1.242e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 1 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.

```



```
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 78.7% (1064 seconds) of the data.
eeg_insertbound(): 162 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
Event resorted by increasing latencies.
Now doing final post-cleanups of the output.
Determining time window rejection thresholds...done.
Keeping 99.9% (1351 seconds) of the data.
eeg_insertbound(): 1 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.02047
iteration 2, gradient norm = 0.01919
iteration 3, gradient norm = 0.01578
iteration 4, gradient norm = 0.01233
iteration 5, gradient norm = 0.01987
iteration 6, gradient norm = 0.02033
iteration 7, gradient norm = 0.01723
iteration 8, gradient norm = 0.01067
iteration 9, gradient norm = 0.003824
iteration 10, gradient norm = 0.002476
iteration 11, gradient norm = 0.001267
iteration 12, gradient norm = 0.001125
iteration 13, gradient norm = 0.001212
iteration 14, gradient norm = 0.0007217
```

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iteration 15, gradient norm = 0.0005803
iteration 16, gradient norm = 0.0004658
iteration 17, gradient norm = 0.0002041
iteration 18, gradient norm = 0.0001695
iteration 19, gradient norm = 0.0001493
iteration 20, gradient norm = 0.0001756
iteration 21, gradient norm = 0.0001201
iteration 22, gradient norm = 7.616e-05
iteration 23, gradient norm = 2.061e-05
iteration 24, gradient norm = 1.83e-05
iteration 25, gradient norm = 1.588e-05
iteration 26, gradient norm = 1.206e-05
iteration 27, gradient norm = 6.242e-06
iteration 28, gradient norm = 4.634e-06
iteration 29, gradient norm = 3.818e-06
iteration 30, gradient norm = 2.479e-06
iteration 31, gradient norm = 1.947e-06
iteration 32, gradient norm = 1.883e-06
iteration 33, gradient norm = 1.809e-06
iteration 34, gradient norm = 8.53e-07
iteration 35, gradient norm = 3.645e-07
iteration 36, gradient norm = 3.195e-07
iteration 37, gradient norm = 2.709e-07
iteration 38, gradient norm = 2.173e-07
iteration 39, gradient norm = 1.614e-07
iteration 40, gradient norm = 1.072e-07
iteration 41, gradient norm = 8.672e-08
iteration 42, gradient norm = 3.724e-08
iteration 43, gradient norm = 2.616e-08
iteration 44, gradient norm = 2.156e-08
iteration 45, gradient norm = 1.554e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A15 with filename: A15_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A16 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A16/1/A16_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A16 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A16/2/A16_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A16 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A16/3/A16_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform

```

```
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02666
iteration 2, gradient norm = 0.009269
iteration 3, gradient norm = 0.01509
iteration 4, gradient norm = 0.009185
iteration 5, gradient norm = 0.008597
iteration 6, gradient norm = 0.002663
iteration 7, gradient norm = 0.00146
iteration 8, gradient norm = 0.001483
iteration 9, gradient norm = 0.001472
iteration 10, gradient norm = 0.001342
iteration 11, gradient norm = 0.001017
iteration 12, gradient norm = 0.0006003
iteration 13, gradient norm = 0.0004329
iteration 14, gradient norm = 0.0003116
iteration 15, gradient norm = 0.0002392
iteration 16, gradient norm = 0.0001626
iteration 17, gradient norm = 0.0001319
iteration 18, gradient norm = 7.162e-05
iteration 19, gradient norm = 5.676e-05
iteration 20, gradient norm = 4.916e-05
iteration 21, gradient norm = 3.249e-05
iteration 22, gradient norm = 1.567e-05
iteration 23, gradient norm = 1.002e-05
iteration 24, gradient norm = 5.963e-06
iteration 25, gradient norm = 5.615e-06
iteration 26, gradient norm = 4.968e-06
iteration 27, gradient norm = 4.02e-06
iteration 28, gradient norm = 2.926e-06
iteration 29, gradient norm = 2.088e-06
iteration 30, gradient norm = 1.641e-06
iteration 31, gradient norm = 1.367e-06
iteration 32, gradient norm = 1.075e-06
iteration 33, gradient norm = 7.341e-07
iteration 34, gradient norm = 4.208e-07
iteration 35, gradient norm = 2.755e-07
iteration 36, gradient norm = 1.998e-07
iteration 37, gradient norm = 1.566e-07
iteration 38, gradient norm = 1.055e-07
iteration 39, gradient norm = 9.736e-08
iteration 40, gradient norm = 4.252e-08
iteration 41, gradient norm = 1.736e-08
iteration 42, gradient norm = 1.509e-08
iteration 43, gradient norm = 1.296e-08
```

```
iteration 44, gradient norm = 1.147e-08
iteration 45, gradient norm = 1.006e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 0 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.1 minutes remaining.
clean_channel: 2/270 blocks, 0.1 minutes remaining.
clean_channel: 3/270 blocks, 0.1 minutes remaining.
clean_channel: 4/270 blocks, 0.1 minutes remaining.
clean_channel: 5/270 blocks, 0.1 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
clean_channel: 34/270 blocks, 0.0 minutes remaining.
clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
clean_channel: 45/270 blocks, 0.0 minutes remaining.
clean_channel: 46/270 blocks, 0.0 minutes remaining.
clean_channel: 47/270 blocks, 0.0 minutes remaining.
clean_channel: 48/270 blocks, 0.0 minutes remaining.
clean_channel: 49/270 blocks, 0.0 minutes remaining.
clean_channel: 50/270 blocks, 0.0 minutes remaining.
```



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clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 75.9% (1027 seconds) of the data.
eeg_insertbound(): 177 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 100.0% (1352 seconds) of the data.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
```

```

Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.007863
iteration 2, gradient norm = 0.008722
iteration 3, gradient norm = 0.00989
iteration 4, gradient norm = 0.01109
iteration 5, gradient norm = 0.01227
iteration 6, gradient norm = 0.005921
iteration 7, gradient norm = 0.004141
iteration 8, gradient norm = 0.004765
iteration 9, gradient norm = 0.004706
iteration 10, gradient norm = 0.003096
iteration 11, gradient norm = 0.002317
iteration 12, gradient norm = 0.001239
iteration 13, gradient norm = 0.0005018
iteration 14, gradient norm = 0.0002545
iteration 15, gradient norm = 0.0001289
iteration 16, gradient norm = 7.604e-05
iteration 17, gradient norm = 3.266e-05
iteration 18, gradient norm = 1.554e-05
iteration 19, gradient norm = 8.457e-06
iteration 20, gradient norm = 6.15e-06
iteration 21, gradient norm = 3.146e-06
iteration 22, gradient norm = 1.196e-06
iteration 23, gradient norm = 7.9e-07
iteration 24, gradient norm = 7.308e-07
iteration 25, gradient norm = 6.009e-07
iteration 26, gradient norm = 4.272e-07
iteration 27, gradient norm = 2.937e-07
iteration 28, gradient norm = 2.35e-07
iteration 29, gradient norm = 1.749e-07
iteration 30, gradient norm = 1.127e-07
iteration 31, gradient norm = 6.003e-08
iteration 32, gradient norm = 3.211e-08
iteration 33, gradient norm = 1.428e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.vi
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A16 with filename: A16_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A17 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A17/1/A17_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A17 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A17/2/A17_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A17 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A17/3/A17_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...

```

```

Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02087
iteration 2, gradient norm = 0.01901
iteration 3, gradient norm = 0.02241
iteration 4, gradient norm = 0.0175
iteration 5, gradient norm = 0.01206
iteration 6, gradient norm = 0.009148
iteration 7, gradient norm = 0.004504
iteration 8, gradient norm = 0.004336
iteration 9, gradient norm = 0.006804
iteration 10, gradient norm = 0.006794
iteration 11, gradient norm = 0.005781
iteration 12, gradient norm = 0.003362
iteration 13, gradient norm = 0.001534
iteration 14, gradient norm = 0.0009242
iteration 15, gradient norm = 0.0004897
iteration 16, gradient norm = 0.0004381
iteration 17, gradient norm = 0.0003579
iteration 18, gradient norm = 0.0003461
iteration 19, gradient norm = 0.0003294
iteration 20, gradient norm = 0.0003134
iteration 21, gradient norm = 0.0002933
iteration 22, gradient norm = 0.0002701
iteration 23, gradient norm = 0.0002347
iteration 24, gradient norm = 0.0001906
iteration 25, gradient norm = 0.0001533
iteration 26, gradient norm = 0.0001366
iteration 27, gradient norm = 0.0001302
iteration 28, gradient norm = 0.0001231
iteration 29, gradient norm = 0.0001092
iteration 30, gradient norm = 8.905e-05
iteration 31, gradient norm = 6.857e-05
iteration 32, gradient norm = 5.468e-05
iteration 33, gradient norm = 4.646e-05
iteration 34, gradient norm = 3.993e-05
iteration 35, gradient norm = 3.277e-05
iteration 36, gradient norm = 2.459e-05
iteration 37, gradient norm = 2.102e-05
iteration 38, gradient norm = 2.328e-05
iteration 39, gradient norm = 1.976e-05
iteration 40, gradient norm = 1.342e-05

```

```

iteration 41, gradient norm = 9.349e-06
iteration 42, gradient norm = 6.21e-06
iteration 43, gradient norm = 3.818e-06
iteration 44, gradient norm = 4.342e-06
iteration 45, gradient norm = 4.656e-06
iteration 46, gradient norm = 4.761e-06
iteration 47, gradient norm = 4.683e-06
iteration 48, gradient norm = 4.492e-06
iteration 49, gradient norm = 4.26e-06
iteration 50, gradient norm = 3.993e-06
iteration 51, gradient norm = 3.651e-06
iteration 52, gradient norm = 3.202e-06
iteration 53, gradient norm = 2.678e-06
iteration 54, gradient norm = 2.182e-06
iteration 55, gradient norm = 1.815e-06
iteration 56, gradient norm = 1.588e-06
iteration 57, gradient norm = 1.438e-06
iteration 58, gradient norm = 1.302e-06
iteration 59, gradient norm = 1.149e-06
iteration 60, gradient norm = 9.696e-07
iteration 61, gradient norm = 7.666e-07
iteration 62, gradient norm = 6.251e-07
iteration 63, gradient norm = 4.991e-07
iteration 64, gradient norm = 4.003e-07
iteration 65, gradient norm = 3.19e-07
iteration 66, gradient norm = 2.386e-07
iteration 67, gradient norm = 1.661e-07
iteration 68, gradient norm = 1.469e-07
iteration 69, gradient norm = 1.582e-07
iteration 70, gradient norm = 1.634e-07
iteration 71, gradient norm = 1.632e-07
iteration 72, gradient norm = 1.583e-07
iteration 73, gradient norm = 1.5e-07
iteration 74, gradient norm = 1.395e-07
iteration 75, gradient norm = 1.282e-07
iteration 76, gradient norm = 1.174e-07
iteration 77, gradient norm = 1.073e-07
iteration 78, gradient norm = 9.671e-08
iteration 79, gradient norm = 8.481e-08
iteration 80, gradient norm = 7.242e-08
iteration 81, gradient norm = 6.116e-08
iteration 82, gradient norm = 5.137e-08
iteration 83, gradient norm = 4.214e-08
iteration 84, gradient norm = 3.324e-08
iteration 85, gradient norm = 2.554e-08
iteration 86, gradient norm = 1.94e-08
iteration 87, gradient norm = 1.711e-08
iteration 88, gradient norm = 1.373e-08
iteration 89, gradient norm = 1.352e-08
iteration 90, gradient norm = 1.157e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 1 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.1 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.

```



```
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 2 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 86.4% (1168 seconds) of the data.
eeg_insertbound(): 100 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 85 blocks.....
eeg_insertbound(): 16 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 100.0% (1339 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
16
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
    Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (16 vs 15) most likely because running under Linux 64-bit
iteration 1, gradient norm = 0.0106
iteration 2, gradient norm = 0.01548
iteration 3, gradient norm = 0.01505
iteration 4, gradient norm = 0.015
iteration 5, gradient norm = 0.01032
iteration 6, gradient norm = 0.007115
iteration 7, gradient norm = 0.01407
iteration 8, gradient norm = 0.01399
```

```

iteration 9, gradient norm = 0.008006
iteration 10, gradient norm = 0.004828
iteration 11, gradient norm = 0.002104
iteration 12, gradient norm = 0.001202
iteration 13, gradient norm = 0.0006158
iteration 14, gradient norm = 0.0004427
iteration 15, gradient norm = 0.0005007
iteration 16, gradient norm = 0.000371
iteration 17, gradient norm = 0.0001697
iteration 18, gradient norm = 6.326e-05
iteration 19, gradient norm = 5.326e-05
iteration 20, gradient norm = 4.375e-05
iteration 21, gradient norm = 2.238e-05
iteration 22, gradient norm = 9.588e-06
iteration 23, gradient norm = 6.989e-06
iteration 24, gradient norm = 6.655e-06
iteration 25, gradient norm = 4.472e-06
iteration 26, gradient norm = 3.109e-06
iteration 27, gradient norm = 2.564e-06
iteration 28, gradient norm = 2.123e-06
iteration 29, gradient norm = 2.067e-06
iteration 30, gradient norm = 1.713e-06
iteration 31, gradient norm = 1.413e-06
iteration 32, gradient norm = 9.784e-07
iteration 33, gradient norm = 9.36e-07
iteration 34, gradient norm = 7.823e-07
iteration 35, gradient norm = 3.897e-07
iteration 36, gradient norm = 2.632e-07
iteration 37, gradient norm = 1.497e-07
iteration 38, gradient norm = 1.346e-07
iteration 39, gradient norm = 8.669e-08
iteration 40, gradient norm = 3.333e-08
iteration 41, gradient norm = 2.17e-08
iteration 42, gradient norm = 1.917e-08
iteration 43, gradient norm = 1.993e-08
iteration 44, gradient norm = 1.304e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A17 with filename: A17_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A18 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/1/A18_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A18 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/2/A18_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A18 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A18/3/A18_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.

```

```

Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.03179
iteration 2, gradient norm = 0.01003
iteration 3, gradient norm = 0.0148
iteration 4, gradient norm = 0.007493
iteration 5, gradient norm = 0.004318
iteration 6, gradient norm = 0.003485
iteration 7, gradient norm = 0.001958
iteration 8, gradient norm = 0.0009676
iteration 9, gradient norm = 0.0008742
iteration 10, gradient norm = 0.001011
iteration 11, gradient norm = 0.001024
iteration 12, gradient norm = 0.0007428
iteration 13, gradient norm = 0.0008055
iteration 14, gradient norm = 0.0009142
iteration 15, gradient norm = 0.001427
iteration 16, gradient norm = 0.0006234
iteration 17, gradient norm = 0.0006554
iteration 18, gradient norm = 0.0007136
iteration 19, gradient norm = 0.0005594
iteration 20, gradient norm = 0.0004959
iteration 21, gradient norm = 0.0003487
iteration 22, gradient norm = 0.0002448
iteration 23, gradient norm = 0.0001594
iteration 24, gradient norm = 9.94e-05
iteration 25, gradient norm = 5.627e-05
iteration 26, gradient norm = 4.254e-05
iteration 27, gradient norm = 2.634e-05
iteration 28, gradient norm = 1.513e-05
iteration 29, gradient norm = 8.972e-06
iteration 30, gradient norm = 5.627e-06
iteration 31, gradient norm = 3.539e-06
iteration 32, gradient norm = 2.178e-06
iteration 33, gradient norm = 1.349e-06
iteration 34, gradient norm = 8.373e-07
iteration 35, gradient norm = 4.899e-07
iteration 36, gradient norm = 3.942e-07
iteration 37, gradient norm = 3.15e-07
iteration 38, gradient norm = 2.498e-07

```

```
iteration 39, gradient norm = 1.902e-07
iteration 40, gradient norm = 1.337e-07
iteration 41, gradient norm = 1.042e-07
iteration 42, gradient norm = 8.183e-08
iteration 43, gradient norm = 5.295e-08
iteration 44, gradient norm = 2.793e-08
iteration 45, gradient norm = 1.376e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 0 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
clean_channel: 34/270 blocks, 0.0 minutes remaining.
clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
clean_channel: 45/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 238/270 blocks, 0.0 minutes remaining.
clean_channel: 239/270 blocks, 0.0 minutes remaining.
clean_channel: 240/270 blocks, 0.0 minutes remaining.
clean_channel: 241/270 blocks, 0.0 minutes remaining.
clean_channel: 242/270 blocks, 0.0 minutes remaining.
clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 55.2% (746 seconds) of the data.
eeg_insertbound(): 306 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 3 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 100.0% (1350 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
```

```

Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
    Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.008857
iteration 2, gradient norm = 0.007569
iteration 3, gradient norm = 0.01686
iteration 4, gradient norm = 0.007053
iteration 5, gradient norm = 0.01038
iteration 6, gradient norm = 0.01627
iteration 7, gradient norm = 0.01725
iteration 8, gradient norm = 0.006473
iteration 9, gradient norm = 0.006034
iteration 10, gradient norm = 0.004209
iteration 11, gradient norm = 0.004361
iteration 12, gradient norm = 0.00455
iteration 13, gradient norm = 0.003839
iteration 14, gradient norm = 0.002626
iteration 15, gradient norm = 0.002069
iteration 16, gradient norm = 0.001897
iteration 17, gradient norm = 0.003023
iteration 18, gradient norm = 0.003139
iteration 19, gradient norm = 0.003155
iteration 20, gradient norm = 0.002952
iteration 21, gradient norm = 0.001477
iteration 22, gradient norm = 0.0005106
iteration 23, gradient norm = 0.0007865
iteration 24, gradient norm = 0.0003093
iteration 25, gradient norm = 0.000159
iteration 26, gradient norm = 8.008e-05
iteration 27, gradient norm = 4.631e-05
iteration 28, gradient norm = 3.947e-05
iteration 29, gradient norm = 2.26e-05
iteration 30, gradient norm = 1.275e-05
iteration 31, gradient norm = 7.718e-06
iteration 32, gradient norm = 5.462e-06
iteration 33, gradient norm = 3.079e-06
iteration 34, gradient norm = 1.527e-06
iteration 35, gradient norm = 1.027e-06
iteration 36, gradient norm = 6.997e-07
iteration 37, gradient norm = 2.431e-07
iteration 38, gradient norm = 1.752e-07
iteration 39, gradient norm = 1.495e-07
iteration 40, gradient norm = 1.064e-07
iteration 41, gradient norm = 6.541e-08
iteration 42, gradient norm = 4.538e-08
iteration 43, gradient norm = 2.429e-08
iteration 44, gradient norm = 1.236e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v

```

```

Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A18 with filename: A18_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A19 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A19/1/A19_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A19 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A19/2/A19_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A19 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A19/3/A19_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02738
iteration 2, gradient norm = 0.02623
iteration 3, gradient norm = 0.02114
iteration 4, gradient norm = 0.01535
iteration 5, gradient norm = 0.0229
iteration 6, gradient norm = 0.01371
iteration 7, gradient norm = 0.01118
iteration 8, gradient norm = 0.009259
iteration 9, gradient norm = 0.008299
iteration 10, gradient norm = 0.006847
iteration 11, gradient norm = 0.007774
iteration 12, gradient norm = 0.007636
iteration 13, gradient norm = 0.006142
iteration 14, gradient norm = 0.004042
iteration 15, gradient norm = 0.003364
iteration 16, gradient norm = 0.003013

```

```

iteration 17, gradient norm = 0.002354
iteration 18, gradient norm = 0.00184
iteration 19, gradient norm = 0.001416
iteration 20, gradient norm = 0.001175
iteration 21, gradient norm = 0.0009596
iteration 22, gradient norm = 0.0007331
iteration 23, gradient norm = 0.0005302
iteration 24, gradient norm = 0.0003901
iteration 25, gradient norm = 0.0001818
iteration 26, gradient norm = 0.0001447
iteration 27, gradient norm = 0.000105
iteration 28, gradient norm = 8.466e-05
iteration 29, gradient norm = 5.58e-05
iteration 30, gradient norm = 4.557e-05
iteration 31, gradient norm = 3.584e-05
iteration 32, gradient norm = 2.619e-05
iteration 33, gradient norm = 1.629e-05
iteration 34, gradient norm = 1.293e-05
iteration 35, gradient norm = 1.328e-05
iteration 36, gradient norm = 9.024e-06
iteration 37, gradient norm = 7.024e-06
iteration 38, gradient norm = 5.75e-06
iteration 39, gradient norm = 6.275e-06
iteration 40, gradient norm = 5.491e-06
iteration 41, gradient norm = 4.26e-06
iteration 42, gradient norm = 3.492e-06
iteration 43, gradient norm = 2.8e-06
iteration 44, gradient norm = 2.189e-06
iteration 45, gradient norm = 1.648e-06
iteration 46, gradient norm = 1.233e-06
iteration 47, gradient norm = 1.01e-06
iteration 48, gradient norm = 8.099e-07
iteration 49, gradient norm = 6.524e-07
iteration 50, gradient norm = 5.116e-07
iteration 51, gradient norm = 3.671e-07
iteration 52, gradient norm = 2.41e-07
iteration 53, gradient norm = 1.677e-07
iteration 54, gradient norm = 1.287e-07
iteration 55, gradient norm = 6.46e-08
iteration 56, gradient norm = 5.502e-08
iteration 57, gradient norm = 4.546e-08
iteration 58, gradient norm = 3.686e-08
iteration 59, gradient norm = 2.777e-08
iteration 60, gradient norm = 1.818e-08
iteration 61, gradient norm = 1.613e-08
iteration 62, gradient norm = 1.439e-08
iteration 63, gradient norm = 1.22e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
2 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 2 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.

```



```
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 73.8% (997 seconds) of the data.
eeg_insertbound(): 83 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 25 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-clean up of the output.
Determining time window rejection thresholds...done.
Keeping 99.3% (1300 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
eeg_insertbound(): 6 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 5 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.02567
iteration 2, gradient norm = 0.01421
iteration 3, gradient norm = 0.02687
iteration 4, gradient norm = 0.008846
```

```

iteration 5, gradient norm = 0.007534
iteration 6, gradient norm = 0.006121
iteration 7, gradient norm = 0.003614
iteration 8, gradient norm = 0.004752
iteration 9, gradient norm = 0.004252
iteration 10, gradient norm = 0.004741
iteration 11, gradient norm = 0.002402
iteration 12, gradient norm = 0.001604
iteration 13, gradient norm = 0.001382
iteration 14, gradient norm = 0.001013
iteration 15, gradient norm = 0.000462
iteration 16, gradient norm = 0.0003542
iteration 17, gradient norm = 0.0003229
iteration 18, gradient norm = 0.0003735
iteration 19, gradient norm = 0.0005023
iteration 20, gradient norm = 0.0008806
iteration 21, gradient norm = 0.001155
iteration 22, gradient norm = 0.001263
iteration 23, gradient norm = 0.001086
iteration 24, gradient norm = 0.0007284
iteration 25, gradient norm = 0.0007552
iteration 26, gradient norm = 0.0007589
iteration 27, gradient norm = 0.0004185
iteration 28, gradient norm = 0.0003301
iteration 29, gradient norm = 0.0002774
iteration 30, gradient norm = 0.0001921
iteration 31, gradient norm = 0.0001618
iteration 32, gradient norm = 0.0001152
iteration 33, gradient norm = 6.797e-05
iteration 34, gradient norm = 3.021e-05
iteration 35, gradient norm = 1.985e-05
iteration 36, gradient norm = 9.085e-06
iteration 37, gradient norm = 5.363e-06
iteration 38, gradient norm = 3.869e-06
iteration 39, gradient norm = 2.879e-06
iteration 40, gradient norm = 2.166e-06
iteration 41, gradient norm = 1.687e-06
iteration 42, gradient norm = 1.499e-06
iteration 43, gradient norm = 1.18e-06
iteration 44, gradient norm = 8.465e-07
iteration 45, gradient norm = 5.858e-07
iteration 46, gradient norm = 4.134e-07
iteration 47, gradient norm = 2.96e-07
iteration 48, gradient norm = 2.041e-07
iteration 49, gradient norm = 1.335e-07
iteration 50, gradient norm = 8.642e-08
iteration 51, gradient norm = 5.814e-08
iteration 52, gradient norm = 4.023e-08
iteration 53, gradient norm = 2.771e-08
iteration 54, gradient norm = 1.857e-08
iteration 55, gradient norm = 1.155e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A19 with filename: A19_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A20 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/1/A20_1_upevent_mark_PrepocD1.set ...

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eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A20 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/2/A20_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A20 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A20/3/A20_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

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```

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.0183
iteration 2, gradient norm = 0.01452
iteration 3, gradient norm = 0.01477
iteration 4, gradient norm = 0.01134
iteration 5, gradient norm = 0.009328
iteration 6, gradient norm = 0.007196
iteration 7, gradient norm = 0.005587
iteration 8, gradient norm = 0.004974
iteration 9, gradient norm = 0.004516
iteration 10, gradient norm = 0.004346
iteration 11, gradient norm = 0.00418
iteration 12, gradient norm = 0.003601
iteration 13, gradient norm = 0.00229
iteration 14, gradient norm = 0.001791
iteration 15, gradient norm = 0.001375
iteration 16, gradient norm = 0.001042
iteration 17, gradient norm = 0.0008177
iteration 18, gradient norm = 0.0003457
iteration 19, gradient norm = 0.0001647
iteration 20, gradient norm = 0.0001094
iteration 21, gradient norm = 7.815e-05
iteration 22, gradient norm = 5.359e-05
iteration 23, gradient norm = 4.597e-05

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iteration 24, gradient norm = 3.679e-05
iteration 25, gradient norm = 2.582e-05
iteration 26, gradient norm = 1.703e-05
iteration 27, gradient norm = 1.065e-05
iteration 28, gradient norm = 6.338e-06
iteration 29, gradient norm = 5.258e-06
iteration 30, gradient norm = 4.283e-06
iteration 31, gradient norm = 3.529e-06
iteration 32, gradient norm = 2.855e-06
iteration 33, gradient norm = 2.19e-06
iteration 34, gradient norm = 1.612e-06
iteration 35, gradient norm = 1.15e-06
iteration 36, gradient norm = 7.642e-07
iteration 37, gradient norm = 5.414e-07
iteration 38, gradient norm = 2.794e-07
iteration 39, gradient norm = 2.364e-07
iteration 40, gradient norm = 1.667e-07
iteration 41, gradient norm = 9.36e-08
iteration 42, gradient norm = 7.354e-08
iteration 43, gradient norm = 6.458e-08
iteration 44, gradient norm = 5.196e-08
iteration 45, gradient norm = 3.709e-08
iteration 46, gradient norm = 2.697e-08
iteration 47, gradient norm = 1.579e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
2 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 2 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.

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clean_channel: 221/270 blocks, 0.0 minutes remaining.
clean_channel: 222/270 blocks, 0.0 minutes remaining.
clean_channel: 223/270 blocks, 0.0 minutes remaining.
clean_channel: 224/270 blocks, 0.0 minutes remaining.
clean_channel: 225/270 blocks, 0.0 minutes remaining.
clean_channel: 226/270 blocks, 0.0 minutes remaining.
clean_channel: 227/270 blocks, 0.0 minutes remaining.
clean_channel: 228/270 blocks, 0.0 minutes remaining.
clean_channel: 229/270 blocks, 0.0 minutes remaining.
clean_channel: 230/270 blocks, 0.0 minutes remaining.
clean_channel: 231/270 blocks, 0.0 minutes remaining.
clean_channel: 232/270 blocks, 0.0 minutes remaining.
clean_channel: 233/270 blocks, 0.0 minutes remaining.
clean_channel: 234/270 blocks, 0.0 minutes remaining.
clean_channel: 235/270 blocks, 0.0 minutes remaining.
clean_channel: 236/270 blocks, 0.0 minutes remaining.
clean_channel: 237/270 blocks, 0.0 minutes remaining.
clean_channel: 238/270 blocks, 0.0 minutes remaining.
clean_channel: 239/270 blocks, 0.0 minutes remaining.
clean_channel: 240/270 blocks, 0.0 minutes remaining.
clean_channel: 241/270 blocks, 0.0 minutes remaining.
clean_channel: 242/270 blocks, 0.0 minutes remaining.
clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 35.2% (475 seconds) of the data.
eeg_insertbound(): 196 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 2 events removed.
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
```

Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 25 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 99.9% (1319 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
eeg_insertbound(): 1 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.01554
iteration 2, gradient norm = 0.02072
iteration 3, gradient norm = 0.01572
iteration 4, gradient norm = 0.0127
iteration 5, gradient norm = 0.007534
iteration 6, gradient norm = 0.005802
iteration 7, gradient norm = 0.005628
iteration 8, gradient norm = 0.005424
iteration 9, gradient norm = 0.002531
iteration 10, gradient norm = 0.001647
iteration 11, gradient norm = 0.0009455
iteration 12, gradient norm = 0.0009948
iteration 13, gradient norm = 0.001151
iteration 14, gradient norm = 0.001176
iteration 15, gradient norm = 0.001115
iteration 16, gradient norm = 0.001057
iteration 17, gradient norm = 0.0006575
iteration 18, gradient norm = 0.0004391
iteration 19, gradient norm = 0.0001734
iteration 20, gradient norm = 9.895e-05
iteration 21, gradient norm = 7.875e-05
iteration 22, gradient norm = 5.496e-05
iteration 23, gradient norm = 4.242e-05
iteration 24, gradient norm = 2.645e-05
iteration 25, gradient norm = 1.911e-05

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iteration 26, gradient norm = 1.835e-05
iteration 27, gradient norm = 1.59e-05
iteration 28, gradient norm = 9.08e-06
iteration 29, gradient norm = 6.082e-06
iteration 30, gradient norm = 4.199e-06
iteration 31, gradient norm = 2.858e-06
iteration 32, gradient norm = 1.718e-06
iteration 33, gradient norm = 8.633e-07
iteration 34, gradient norm = 4.421e-07
iteration 35, gradient norm = 2.387e-07
iteration 36, gradient norm = 1.763e-07
iteration 37, gradient norm = 1.225e-07
iteration 38, gradient norm = 1.137e-07
iteration 39, gradient norm = 6.967e-08
iteration 40, gradient norm = 4.964e-08
iteration 41, gradient norm = 3.482e-08
iteration 42, gradient norm = 3.82e-08
iteration 43, gradient norm = 2.13e-08
iteration 44, gradient norm = 1.513e-08
iteration 45, gradient norm = 1.045e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v...
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A20 with filename: A20_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A21 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A21/1/A21_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A21 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A21/2/A21_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A21 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A21/3/A21_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform

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```
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
```

```
Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02504
iteration 2, gradient norm = 0.0203
iteration 3, gradient norm = 0.02099
iteration 4, gradient norm = 0.02207
iteration 5, gradient norm = 0.01279
iteration 6, gradient norm = 0.00868
iteration 7, gradient norm = 0.003585
iteration 8, gradient norm = 0.002317
iteration 9, gradient norm = 0.001645
iteration 10, gradient norm = 0.002521
iteration 11, gradient norm = 0.002939
iteration 12, gradient norm = 0.001646
iteration 13, gradient norm = 0.001771
iteration 14, gradient norm = 0.001987
iteration 15, gradient norm = 0.002873
iteration 16, gradient norm = 0.002153
iteration 17, gradient norm = 0.00135
iteration 18, gradient norm = 0.001198
iteration 19, gradient norm = 0.0005242
iteration 20, gradient norm = 0.0003219
iteration 21, gradient norm = 0.0002603
iteration 22, gradient norm = 0.0002423
iteration 23, gradient norm = 0.0002029
iteration 24, gradient norm = 0.0001526
iteration 25, gradient norm = 0.0001043
iteration 26, gradient norm = 6.891e-05
iteration 27, gradient norm = 4.271e-05
iteration 28, gradient norm = 2.814e-05
iteration 29, gradient norm = 2.587e-05
iteration 30, gradient norm = 2.299e-05
iteration 31, gradient norm = 1.956e-05
iteration 32, gradient norm = 1.602e-05
iteration 33, gradient norm = 1.269e-05
iteration 34, gradient norm = 1.035e-05
iteration 35, gradient norm = 9.146e-06
iteration 36, gradient norm = 7.527e-06
iteration 37, gradient norm = 6.071e-06
iteration 38, gradient norm = 5.664e-06
iteration 39, gradient norm = 4.581e-06
iteration 40, gradient norm = 2.464e-06
iteration 41, gradient norm = 2.453e-06
iteration 42, gradient norm = 1.679e-06
iteration 43, gradient norm = 9.466e-07
iteration 44, gradient norm = 5.522e-07
iteration 45, gradient norm = 4.324e-07
iteration 46, gradient norm = 3.929e-07
iteration 47, gradient norm = 2.664e-07
iteration 48, gradient norm = 1.806e-07
iteration 49, gradient norm = 1.575e-07
iteration 50, gradient norm = 1.365e-07
iteration 51, gradient norm = 8.945e-08
iteration 52, gradient norm = 8.084e-08
iteration 53, gradient norm = 6.63e-08
iteration 54, gradient norm = 6.266e-08
```

```
iteration 55, gradient norm = 3.913e-08
iteration 56, gradient norm = 3.465e-08
iteration 57, gradient norm = 3.081e-08
iteration 58, gradient norm = 2.97e-08
iteration 59, gradient norm = 1.777e-08
iteration 60, gradient norm = 1.753e-08
iteration 61, gradient norm = 1.564e-08
iteration 62, gradient norm = 1.434e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
2 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 2 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.1 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
clean_channel: 34/270 blocks, 0.0 minutes remaining.
clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 237/270 blocks, 0.0 minutes remaining.
clean_channel: 238/270 blocks, 0.0 minutes remaining.
clean_channel: 239/270 blocks, 0.0 minutes remaining.
clean_channel: 240/270 blocks, 0.0 minutes remaining.
clean_channel: 241/270 blocks, 0.0 minutes remaining.
clean_channel: 242/270 blocks, 0.0 minutes remaining.
clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
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clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 78.6% (1062 seconds) of the data.
eeg_insertbound(): 156 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 3 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanups of the output.
Determining time window rejection thresholds...done.
Keeping 99.7% (1344 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
eeg_insertbound(): 3 boundary (break) events added.
```

```
eeg_insertbound(): boundary events inserted and 1 events removed.  
Scaling components to RMS microvolt  
eeg_checkset: recomputing the ICA activation matrix ...  
eeg_checkset note: event field format 'binlabel' made uniform  
eeg_checkset note: event field format 'codelabel' made uniform  
Event resorted by increasing latencies.  
Event resorted by increasing latencies.  
Use vis_artifacts to compare the cleaned data to the original.  
Done.  
Keeping this many channels:  
17  
Interpolating 2 channels...  
Warning: some channels have the same label  
Re-referencing data  
Removing 2 channel(s)...  
Event resorted by increasing latencies.  
Re-referencing ICA matrix  
  
Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).  
Decomposition saved as entry 1.  
Attempting to convert data matrix to double precision for more accurate ICA results.  
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M  
iteration 1, gradient norm = 0.02603  
iteration 2, gradient norm = 0.02835  
iteration 3, gradient norm = 0.027  
iteration 4, gradient norm = 0.02076  
iteration 5, gradient norm = 0.01189  
iteration 6, gradient norm = 0.01538  
iteration 7, gradient norm = 0.007376  
iteration 8, gradient norm = 0.004776  
iteration 9, gradient norm = 0.005552  
iteration 10, gradient norm = 0.003569  
iteration 11, gradient norm = 0.002606  
iteration 12, gradient norm = 0.001576  
iteration 13, gradient norm = 0.001247  
iteration 14, gradient norm = 0.001058  
iteration 15, gradient norm = 0.001076  
iteration 16, gradient norm = 0.0008802  
iteration 17, gradient norm = 0.0006493  
iteration 18, gradient norm = 0.0007636  
iteration 19, gradient norm = 0.001075  
iteration 20, gradient norm = 0.00198  
iteration 21, gradient norm = 0.002871  
iteration 22, gradient norm = 0.002529  
iteration 23, gradient norm = 0.001037  
iteration 24, gradient norm = 0.0006973  
iteration 25, gradient norm = 0.0006205  
iteration 26, gradient norm = 0.0003184  
iteration 27, gradient norm = 0.0003239  
iteration 28, gradient norm = 0.0003541  
iteration 29, gradient norm = 0.0003814  
iteration 30, gradient norm = 0.0004177  
iteration 31, gradient norm = 0.000421  
iteration 32, gradient norm = 0.0005849  
iteration 33, gradient norm = 0.000616  
iteration 34, gradient norm = 0.0004456  
iteration 35, gradient norm = 0.0002927  
iteration 36, gradient norm = 0.0003037  
iteration 37, gradient norm = 0.0001929  
iteration 38, gradient norm = 9.92e-05  
iteration 39, gradient norm = 8.749e-05  
iteration 40, gradient norm = 8.766e-05  
iteration 41, gradient norm = 3.429e-05  
iteration 42, gradient norm = 2.239e-05
```

```

iteration 43, gradient norm = 1.676e-05
iteration 44, gradient norm = 1.049e-05
iteration 45, gradient norm = 7.048e-06
iteration 46, gradient norm = 6.358e-06
iteration 47, gradient norm = 6.112e-06
iteration 48, gradient norm = 2.781e-06
iteration 49, gradient norm = 1.998e-06
iteration 50, gradient norm = 1.666e-06
iteration 51, gradient norm = 1.092e-06
iteration 52, gradient norm = 6.82e-07
iteration 53, gradient norm = 6.627e-07
iteration 54, gradient norm = 7.873e-07
iteration 55, gradient norm = 5.851e-07
iteration 56, gradient norm = 2.55e-07
iteration 57, gradient norm = 1.611e-07
iteration 58, gradient norm = 1.748e-07
iteration 59, gradient norm = 9.087e-08
iteration 60, gradient norm = 7.547e-08
iteration 61, gradient norm = 7.314e-08
iteration 62, gradient norm = 5.193e-08
iteration 63, gradient norm = 2.23e-08
iteration 64, gradient norm = 1.102e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A21 with filename: A21_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A22 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/1/A22_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A22 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/2/A22_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A22 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A22/3/A22_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames

```

```
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00
```

```
Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.01551
iteration 2, gradient norm = 0.01236
iteration 3, gradient norm = 0.007924
iteration 4, gradient norm = 0.005051
iteration 5, gradient norm = 0.003344
iteration 6, gradient norm = 0.001819
iteration 7, gradient norm = 0.002222
iteration 8, gradient norm = 0.003863
iteration 9, gradient norm = 0.007371
iteration 10, gradient norm = 0.005853
iteration 11, gradient norm = 0.004093
iteration 12, gradient norm = 0.001232
iteration 13, gradient norm = 0.001069
iteration 14, gradient norm = 0.0006815
iteration 15, gradient norm = 0.000533
iteration 16, gradient norm = 0.0003969
iteration 17, gradient norm = 0.0001839
iteration 18, gradient norm = 0.0001427
iteration 19, gradient norm = 0.0001745
iteration 20, gradient norm = 0.0002379
iteration 21, gradient norm = 0.0004128
iteration 22, gradient norm = 0.000585
iteration 23, gradient norm = 0.0004819
iteration 24, gradient norm = 0.0002282
iteration 25, gradient norm = 0.000141
iteration 26, gradient norm = 7.943e-05
iteration 27, gradient norm = 6.419e-05
iteration 28, gradient norm = 6.111e-05
iteration 29, gradient norm = 6.309e-05
iteration 30, gradient norm = 5.947e-05
iteration 31, gradient norm = 3.51e-05
iteration 32, gradient norm = 1.827e-05
iteration 33, gradient norm = 1.228e-05
iteration 34, gradient norm = 1.03e-05
iteration 35, gradient norm = 8.38e-06
iteration 36, gradient norm = 5.209e-06
iteration 37, gradient norm = 2.523e-06
iteration 38, gradient norm = 1.955e-06
iteration 39, gradient norm = 1.212e-06
iteration 40, gradient norm = 9.208e-07
iteration 41, gradient norm = 7.487e-07
iteration 42, gradient norm = 4.603e-07
iteration 43, gradient norm = 3.922e-07
iteration 44, gradient norm = 2.426e-07
iteration 45, gradient norm = 1.318e-07
iteration 46, gradient norm = 1.128e-07
iteration 47, gradient norm = 1.009e-07
iteration 48, gradient norm = 1.151e-07
iteration 49, gradient norm = 9.869e-08
iteration 50, gradient norm = 7.597e-08
iteration 51, gradient norm = 3.41e-08
iteration 52, gradient norm = 1.88e-08
```

```
iteration 53, gradient norm = 2.039e-08
iteration 54, gradient norm = 2.019e-08
iteration 55, gradient norm = 1.127e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 0 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
clean_channel: 34/270 blocks, 0.0 minutes remaining.
clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
clean_channel: 45/270 blocks, 0.0 minutes remaining.
clean_channel: 46/270 blocks, 0.0 minutes remaining.
clean_channel: 47/270 blocks, 0.0 minutes remaining.
clean_channel: 48/270 blocks, 0.0 minutes remaining.
clean_channel: 49/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 242/270 blocks, 0.0 minutes remaining.
clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 95.5% (1290 seconds) of the data.
eeg_insertbound(): 41 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 4 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 100.0% (1349 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
17
Interpolating 2 channels...
Warning: some channels have the same label
```

```

Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG.etc.oldicaweights" (etc.).
    Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.01104
iteration 2, gradient norm = 0.01113
iteration 3, gradient norm = 0.006996
iteration 4, gradient norm = 0.005112
iteration 5, gradient norm = 0.005013
iteration 6, gradient norm = 0.006446
iteration 7, gradient norm = 0.007032
iteration 8, gradient norm = 0.006803
iteration 9, gradient norm = 0.00319
iteration 10, gradient norm = 0.004269
iteration 11, gradient norm = 0.00703
iteration 12, gradient norm = 0.004456
iteration 13, gradient norm = 0.001323
iteration 14, gradient norm = 0.0009512
iteration 15, gradient norm = 0.0004654
iteration 16, gradient norm = 0.0002876
iteration 17, gradient norm = 0.0001524
iteration 18, gradient norm = 0.000105
iteration 19, gradient norm = 9.669e-05
iteration 20, gradient norm = 7.672e-05
iteration 21, gradient norm = 6.779e-05
iteration 22, gradient norm = 4.347e-05
iteration 23, gradient norm = 2.949e-05
iteration 24, gradient norm = 2.316e-05
iteration 25, gradient norm = 1.833e-05
iteration 26, gradient norm = 1.907e-05
iteration 27, gradient norm = 1.125e-05
iteration 28, gradient norm = 8.329e-06
iteration 29, gradient norm = 6.255e-06
iteration 30, gradient norm = 5.008e-06
iteration 31, gradient norm = 2.701e-06
iteration 32, gradient norm = 1.683e-06
iteration 33, gradient norm = 1.067e-06
iteration 34, gradient norm = 7.761e-07
iteration 35, gradient norm = 6.205e-07
iteration 36, gradient norm = 2.728e-07
iteration 37, gradient norm = 2.105e-07
iteration 38, gradient norm = 2.133e-07
iteration 39, gradient norm = 2.146e-07
iteration 40, gradient norm = 1.169e-07
iteration 41, gradient norm = 8.356e-08
iteration 42, gradient norm = 8.438e-08
iteration 43, gradient norm = 7.798e-08
iteration 44, gradient norm = 4.797e-08
iteration 45, gradient norm = 3.167e-08
iteration 46, gradient norm = 2.306e-08
iteration 47, gradient norm = 1.971e-08
iteration 48, gradient norm = 1.16e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)

```

ICLabel: saving results...
 0 components flagged for rejection, to reject them use Tools > Remove components from data
 Saving data for A22 with filename: A22_upevent_mark_PrepocDAll.set
 Saving dataset...
 Processing subject: A23 for folder 1
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A23/1/A23_1_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Processing subject: A23 for folder 2
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A23/2/A23_2_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Processing subject: A23 for folder 3
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A23/3/A23_3_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Merging datasets...
 Warning: second dataset has empty urevent structure.
 Concatenating events...
 Adding boundary event...
 Reconstituting epoch information...
 eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Warning: duplicate boundary event removed
 Event resorted by increasing latencies.
 Merging datasets...
 Warning: second dataset has empty urevent structure.
 Concatenating events...
 Adding boundary event...
 Reconstituting epoch information...
 eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Warning: duplicate boundary event removed
 Event resorted by increasing latencies.
 pop_eegfiltnew() - performing 415 point highpass filtering.
 pop_eegfiltnew() - transition band width: 2 Hz
 pop_eegfiltnew() - passband edge(s): 2 Hz
 pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
 pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
 firfilt(): |=====| 100%, ETE 00:00

 Attempting to convert data matrix to double precision for more accurate ICA results.
 iteration 1, gradient norm = 0.03501
 iteration 2, gradient norm = 0.01264
 iteration 3, gradient norm = 0.01283
 iteration 4, gradient norm = 0.01074
 iteration 5, gradient norm = 0.003027
 iteration 6, gradient norm = 0.004548
 iteration 7, gradient norm = 0.002603
 iteration 8, gradient norm = 0.0004186
 iteration 9, gradient norm = 0.0004479
 iteration 10, gradient norm = 0.0001807
 iteration 11, gradient norm = 5.496e-05
 iteration 12, gradient norm = 5.155e-05
 iteration 13, gradient norm = 2.276e-05
 iteration 14, gradient norm = 1.122e-05
 iteration 15, gradient norm = 7.423e-06
 iteration 16, gradient norm = 4.131e-06
 iteration 17, gradient norm = 2.079e-06

```
iteration 18, gradient norm = 1.088e-06
iteration 19, gradient norm = 5.506e-07
iteration 20, gradient norm = 1.046e-07
iteration 21, gradient norm = 5.373e-08
iteration 22, gradient norm = 2.821e-08
iteration 23, gradient norm = 1.005e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
3 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 3 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
clean_channel: 34/270 blocks, 0.0 minutes remaining.
clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
clean_channel: 45/270 blocks, 0.0 minutes remaining.
clean_channel: 46/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 239/270 blocks, 0.0 minutes remaining.
clean_channel: 240/270 blocks, 0.0 minutes remaining.
clean_channel: 241/270 blocks, 0.0 minutes remaining.
clean_channel: 242/270 blocks, 0.0 minutes remaining.
clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 2 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 70.2% (948 seconds) of the data.
eeg_insertbound(): 229 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 85 blocks.....
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 99.8% (1348 seconds) of the data.
eeg_insertbound(): 2 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
```

```
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix
```

```
Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
```

```
Attempting to convert data matrix to double precision for more accurate ICA results.
```

```
Warning: fixing rank computation inconsistency (16 vs 15) most likely because running under Linux 64-bit M
```

```
iteration 1, gradient norm = 0.01106
iteration 2, gradient norm = 0.01395
iteration 3, gradient norm = 0.02044
iteration 4, gradient norm = 0.01398
iteration 5, gradient norm = 0.01686
iteration 6, gradient norm = 0.007171
iteration 7, gradient norm = 0.005656
iteration 8, gradient norm = 0.005451
iteration 9, gradient norm = 0.001759
iteration 10, gradient norm = 0.001097
iteration 11, gradient norm = 0.001641
iteration 12, gradient norm = 0.003239
iteration 13, gradient norm = 0.01059
iteration 14, gradient norm = 0.01158
iteration 15, gradient norm = 0.01263
iteration 16, gradient norm = 0.01376
iteration 17, gradient norm = 0.01496
iteration 18, gradient norm = 0.01621
iteration 19, gradient norm = 0.01751
iteration 20, gradient norm = 0.01884
iteration 21, gradient norm = 0.02017
iteration 22, gradient norm = 0.02149
iteration 23, gradient norm = 0.02275
iteration 24, gradient norm = 0.02392
iteration 25, gradient norm = 0.02495
iteration 26, gradient norm = 0.0258
iteration 27, gradient norm = 0.02659
iteration 28, gradient norm = 0.02621
iteration 29, gradient norm = 0.01201
iteration 30, gradient norm = 0.003578
iteration 31, gradient norm = 0.0003445
iteration 32, gradient norm = 0.0002928
iteration 33, gradient norm = 0.000319
iteration 34, gradient norm = 0.0002604
iteration 35, gradient norm = 0.0001846
iteration 36, gradient norm = 0.0002289
iteration 37, gradient norm = 0.0001215
iteration 38, gradient norm = 5.31e-05
iteration 39, gradient norm = 3.392e-05
iteration 40, gradient norm = 2.744e-05
iteration 41, gradient norm = 1.072e-05
iteration 42, gradient norm = 5.449e-06
iteration 43, gradient norm = 2.253e-06
iteration 44, gradient norm = 1.359e-06
iteration 45, gradient norm = 7.781e-07
iteration 46, gradient norm = 3.761e-07
iteration 47, gradient norm = 3.733e-07
iteration 48, gradient norm = 3.021e-07
iteration 49, gradient norm = 1.739e-07
iteration 50, gradient norm = 1.016e-07
iteration 51, gradient norm = 8.75e-08
iteration 52, gradient norm = 8.337e-08
iteration 53, gradient norm = 5.987e-08
```

```

iteration 54, gradient norm = 2.982e-08
iteration 55, gradient norm = 1.782e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A23 with filename: A23_upevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A24 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/1/A24_1_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A24 for folder 2
pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/2/A24_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A24 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A24/3/A24_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.01941
iteration 2, gradient norm = 0.01907
iteration 3, gradient norm = 0.02327
iteration 4, gradient norm = 0.01066
iteration 5, gradient norm = 0.008339
iteration 6, gradient norm = 0.008871
iteration 7, gradient norm = 0.009618
iteration 8, gradient norm = 0.008686

```

```

iteration 9, gradient norm = 0.006812
iteration 10, gradient norm = 0.002039
iteration 11, gradient norm = 0.001549
iteration 12, gradient norm = 0.0008641
iteration 13, gradient norm = 0.0007606
iteration 14, gradient norm = 0.0006612
iteration 15, gradient norm = 0.0005768
iteration 16, gradient norm = 0.000502
iteration 17, gradient norm = 0.0004406
iteration 18, gradient norm = 0.000381
iteration 19, gradient norm = 0.0003122
iteration 20, gradient norm = 0.0002205
iteration 21, gradient norm = 0.0001207
iteration 22, gradient norm = 8.939e-05
iteration 23, gradient norm = 4.887e-05
iteration 24, gradient norm = 2.798e-05
iteration 25, gradient norm = 1.392e-05
iteration 26, gradient norm = 1.122e-05
iteration 27, gradient norm = 8.046e-06
iteration 28, gradient norm = 4.919e-06
iteration 29, gradient norm = 2.752e-06
iteration 30, gradient norm = 2.219e-06
iteration 31, gradient norm = 1.566e-06
iteration 32, gradient norm = 1.143e-06
iteration 33, gradient norm = 8.948e-07
iteration 34, gradient norm = 7.334e-07
iteration 35, gradient norm = 6.265e-07
iteration 36, gradient norm = 5.347e-07
iteration 37, gradient norm = 4.348e-07
iteration 38, gradient norm = 3.167e-07
iteration 39, gradient norm = 1.828e-07
iteration 40, gradient norm = 1.111e-07
iteration 41, gradient norm = 6.096e-08
iteration 42, gradient norm = 3.633e-08
iteration 43, gradient norm = 2.376e-08
iteration 44, gradient norm = 1.8e-08
iteration 45, gradient norm = 1.224e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
4 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 4 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.

```


Removing 2 channel(s)...

```

Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 32.3% (436 seconds) of the data.
eeg_insertbound(): 321 boundary (break) events added.
eeg_insertbound(): boundary events inserted and 1 events removed.
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srat+1 = number of frames
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 85 blocks.....
Event resorted by increasing latencies.
Now doing final post-cleanup of the output.
Determining time window rejection thresholds...done.
Keeping 72.5% (981 seconds) of the data.
eeg_insertbound(): 216 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Use vis_artifacts to compare the cleaned data to the original.
Done.
Keeping this many channels:
16
Interpolating 2 channels...
Warning: some channels have the same label
Re-referencing data
Removing 2 channel(s)...
Event resorted by increasing latencies.
Re-referencing ICA matrix

Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).
Decomposition saved as entry 1.
Attempting to convert data matrix to double precision for more accurate ICA results.
Warning: fixing rank computation inconsistency (16 vs 14) most likely because running under Linux 64-bit M
iteration 1, gradient norm = 0.01343
iteration 2, gradient norm = 0.01316
iteration 3, gradient norm = 0.02243
iteration 4, gradient norm = 0.01554
iteration 5, gradient norm = 0.02914
iteration 6, gradient norm = 0.01075
iteration 7, gradient norm = 0.01101
iteration 8, gradient norm = 0.008578
iteration 9, gradient norm = 0.005096
iteration 10, gradient norm = 0.005792
iteration 11, gradient norm = 0.002474
iteration 12, gradient norm = 0.001544
iteration 13, gradient norm = 0.0013
iteration 14, gradient norm = 0.001003
iteration 15, gradient norm = 0.0003234
iteration 16, gradient norm = 0.0003169
iteration 17, gradient norm = 0.0003565
iteration 18, gradient norm = 0.000464
iteration 19, gradient norm = 0.0008094
iteration 20, gradient norm = 0.001353

```

```
iteration 21, gradient norm = 0.000779
iteration 22, gradient norm = 0.0006891
iteration 23, gradient norm = 0.0006256
iteration 24, gradient norm = 0.0004607
iteration 25, gradient norm = 0.0004918
iteration 26, gradient norm = 0.0005926
iteration 27, gradient norm = 0.0007078
iteration 28, gradient norm = 0.002055
iteration 29, gradient norm = 0.003164
iteration 30, gradient norm = 0.002741
iteration 31, gradient norm = 0.003045
iteration 32, gradient norm = 0.002639
iteration 33, gradient norm = 0.002067
iteration 34, gradient norm = 0.001444
iteration 35, gradient norm = 0.0007632
iteration 36, gradient norm = 0.0004885
iteration 37, gradient norm = 0.0002064
iteration 38, gradient norm = 0.0001364
iteration 39, gradient norm = 0.0001039
iteration 40, gradient norm = 6.882e-05
iteration 41, gradient norm = 6.748e-05
iteration 42, gradient norm = 4.347e-05
iteration 43, gradient norm = 2.222e-05
iteration 44, gradient norm = 2.58e-05
iteration 45, gradient norm = 2.676e-05
iteration 46, gradient norm = 2.326e-05
iteration 47, gradient norm = 1.151e-05
iteration 48, gradient norm = 9.313e-06
iteration 49, gradient norm = 1.319e-05
iteration 50, gradient norm = 1.482e-05
iteration 51, gradient norm = 1.103e-05
iteration 52, gradient norm = 1.264e-05
iteration 53, gradient norm = 1.034e-05
iteration 54, gradient norm = 6.872e-06
iteration 55, gradient norm = 4.815e-06
iteration 56, gradient norm = 3.047e-06
iteration 57, gradient norm = 1.596e-06
iteration 58, gradient norm = 8.597e-07
iteration 59, gradient norm = 1.036e-06
iteration 60, gradient norm = 9.259e-07
iteration 61, gradient norm = 5.943e-07
iteration 62, gradient norm = 5.047e-07
iteration 63, gradient norm = 4.03e-07
iteration 64, gradient norm = 5.127e-07
iteration 65, gradient norm = 4.185e-07
iteration 66, gradient norm = 2.018e-07
iteration 67, gradient norm = 2.106e-07
iteration 68, gradient norm = 1.668e-07
iteration 69, gradient norm = 1.437e-07
iteration 70, gradient norm = 9.188e-08
iteration 71, gradient norm = 1.031e-07
iteration 72, gradient norm = 1.147e-07
iteration 73, gradient norm = 8.099e-08
iteration 74, gradient norm = 4.234e-08
iteration 75, gradient norm = 2.498e-08
iteration 76, gradient norm = 2.223e-08
iteration 77, gradient norm = 1.481e-08
iteration 78, gradient norm = 1.426e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
```

Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
 ICLLabel: saving results...
 0 components flagged for rejection, to reject them use Tools > Remove components from data
 Saving data for A24 with filename: A24_upevent_mark_PrepocDAll.set
 Saving dataset...
 Processing subject: A27 for folder 1
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/1/A27_1_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Processing subject: A27 for folder 2
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/2/A27_2_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Processing subject: A27 for folder 3
 pop_loadset(): loading file ../nback_study_VR_EEG_data/A27/3/A27_3_upevent_mark_PrepocD1.set ...
 eeg_insertbound(): 2 boundary (break) events added.
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Merging datasets...
 Warning: second dataset has empty urevent structure.
 Concatenating events...
 Adding boundary event...
 Reconstituting epoch information...
 eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Warning: duplicate boundary event removed
 Event resorted by increasing latencies.
 Merging datasets...
 Warning: second dataset has empty urevent structure.
 Concatenating events...
 Adding boundary event...
 Reconstituting epoch information...
 eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
 eeg_checkset note: event field format 'binlabel' made uniform
 eeg_checkset note: event field format 'codelabel' made uniform
 Warning: duplicate boundary event removed
 Event resorted by increasing latencies.
 pop_eegfiltnew() - performing 415 point highpass filtering.
 pop_eegfiltnew() - transition band width: 2 Hz
 pop_eegfiltnew() - passband edge(s): 2 Hz
 pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
 pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
 firfilt(): |=====| 100%, ETE 00:00

Attempting to convert data matrix to double precision for more accurate ICA results.
 iteration 1, gradient norm = 0.03401
 iteration 2, gradient norm = 0.02568
 iteration 3, gradient norm = 0.03411
 iteration 4, gradient norm = 0.01602
 iteration 5, gradient norm = 0.01082
 iteration 6, gradient norm = 0.005096
 iteration 7, gradient norm = 0.005014
 iteration 8, gradient norm = 0.004104
 iteration 9, gradient norm = 0.004016
 iteration 10, gradient norm = 0.003275
 iteration 11, gradient norm = 0.003667
 iteration 12, gradient norm = 0.002439
 iteration 13, gradient norm = 0.002258
 iteration 14, gradient norm = 0.00186
 iteration 15, gradient norm = 0.002109
 iteration 16, gradient norm = 0.002636

```
iteration 17, gradient norm = 0.003149
iteration 18, gradient norm = 0.002727
iteration 19, gradient norm = 0.002225
iteration 20, gradient norm = 0.001154
iteration 21, gradient norm = 0.0007553
iteration 22, gradient norm = 0.0006563
iteration 23, gradient norm = 0.0003728
iteration 24, gradient norm = 0.0002672
iteration 25, gradient norm = 0.0002597
iteration 26, gradient norm = 0.0002316
iteration 27, gradient norm = 0.000145
iteration 28, gradient norm = 0.0001075
iteration 29, gradient norm = 7.004e-05
iteration 30, gradient norm = 4.223e-05
iteration 31, gradient norm = 2.719e-05
iteration 32, gradient norm = 2.481e-05
iteration 33, gradient norm = 2.632e-05
iteration 34, gradient norm = 2.582e-05
iteration 35, gradient norm = 2.134e-05
iteration 36, gradient norm = 1.797e-05
iteration 37, gradient norm = 1.862e-05
iteration 38, gradient norm = 2.21e-05
iteration 39, gradient norm = 1.892e-05
iteration 40, gradient norm = 1.763e-05
iteration 41, gradient norm = 1.635e-05
iteration 42, gradient norm = 1.411e-05
iteration 43, gradient norm = 1.156e-05
iteration 44, gradient norm = 8.982e-06
iteration 45, gradient norm = 6.88e-06
iteration 46, gradient norm = 6.361e-06
iteration 47, gradient norm = 5.93e-06
iteration 48, gradient norm = 3.118e-06
iteration 49, gradient norm = 2.711e-06
iteration 50, gradient norm = 2.273e-06
iteration 51, gradient norm = 1.947e-06
iteration 52, gradient norm = 1.203e-06
iteration 53, gradient norm = 7.99e-07
iteration 54, gradient norm = 6.022e-07
iteration 55, gradient norm = 6.376e-07
iteration 56, gradient norm = 3.942e-07
iteration 57, gradient norm = 3.729e-07
iteration 58, gradient norm = 4.551e-07
iteration 59, gradient norm = 5.327e-07
iteration 60, gradient norm = 4.666e-07
iteration 61, gradient norm = 3.55e-07
iteration 62, gradient norm = 4.091e-07
iteration 63, gradient norm = 4.244e-07
iteration 64, gradient norm = 4.058e-07
iteration 65, gradient norm = 3.579e-07
iteration 66, gradient norm = 2.944e-07
iteration 67, gradient norm = 2.289e-07
iteration 68, gradient norm = 1.674e-07
iteration 69, gradient norm = 1.176e-07
iteration 70, gradient norm = 8.749e-08
iteration 71, gradient norm = 7.592e-08
iteration 72, gradient norm = 6.314e-08
iteration 73, gradient norm = 5.226e-08
iteration 74, gradient norm = 4.087e-08
iteration 75, gradient norm = 3.514e-08
iteration 76, gradient norm = 2.015e-08
iteration 77, gradient norm = 1.412e-08
iteration 78, gradient norm = 1.63e-08
iteration 79, gradient norm = 1.612e-08
iteration 80, gradient norm = 1.502e-08
```

```
iteration 81, gradient norm = 1.241e-08
iteration 82, gradient norm = 1.375e-08
iteration 83, gradient norm = 1.825e-08
iteration 84, gradient norm = 1.4e-08
iteration 85, gradient norm = 1.38e-08
iteration 86, gradient norm = 1.242e-08
iteration 87, gradient norm = 1.087e-08
iteration 88, gradient norm = 1.02e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 1 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
clean_channel: 15/270 blocks, 0.0 minutes remaining.
clean_channel: 16/270 blocks, 0.0 minutes remaining.
clean_channel: 17/270 blocks, 0.0 minutes remaining.
clean_channel: 18/270 blocks, 0.0 minutes remaining.
clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.
clean_channel: 33/270 blocks, 0.0 minutes remaining.
clean_channel: 34/270 blocks, 0.0 minutes remaining.
clean_channel: 35/270 blocks, 0.0 minutes remaining.
clean_channel: 36/270 blocks, 0.0 minutes remaining.
clean_channel: 37/270 blocks, 0.0 minutes remaining.
clean_channel: 38/270 blocks, 0.0 minutes remaining.
clean_channel: 39/270 blocks, 0.0 minutes remaining.
clean_channel: 40/270 blocks, 0.0 minutes remaining.
clean_channel: 41/270 blocks, 0.0 minutes remaining.
clean_channel: 42/270 blocks, 0.0 minutes remaining.
clean_channel: 43/270 blocks, 0.0 minutes remaining.
clean_channel: 44/270 blocks, 0.0 minutes remaining.
```



```
clean_channel: 237/270 blocks, 0.0 minutes remaining.
clean_channel: 238/270 blocks, 0.0 minutes remaining.
clean_channel: 239/270 blocks, 0.0 minutes remaining.
clean_channel: 240/270 blocks, 0.0 minutes remaining.
clean_channel: 241/270 blocks, 0.0 minutes remaining.
clean_channel: 242/270 blocks, 0.0 minutes remaining.
clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
clean_channel: 248/270 blocks, 0.0 minutes remaining.
clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 44.0% (594 seconds) of the data.
eeg_insertbound(): 262 boundary (break) events added.
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
eeg_insertbound(): 6 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Now doing final post-cleanups of the output.
Determining time window rejection thresholds...done.
Keeping 95.1% (1280 seconds) of the data.
eeg_lat2point(): Points out of range detected. Points replaced with maximum value
eeg_insertbound(): 42 boundary (break) events added.
```

```
eeg_insertbound(): boundary events inserted and 4 events removed.  
Scaling components to RMS microvolt  
eeg_checkset: recomputing the ICA activation matrix ...  
eeg_checkset note: event field format 'binlabel' made uniform  
eeg_checkset note: event field format 'codelabel' made uniform  
Warning: duplicate boundary event removed  
Event resorted by increasing latencies.  
Event resorted by increasing latencies.  
Use vis_artifacts to compare the cleaned data to the original.  
Done.  
Keeping this many channels:  
17  
Interpolating 2 channels...  
Warning: some channels have the same label  
Re-referencing data  
Removing 2 channel(s)...  
Event resorted by increasing latencies.  
Re-referencing ICA matrix  
  
Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).  
Decomposition saved as entry 1.  
Attempting to convert data matrix to double precision for more accurate ICA results.  
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M  
iteration 1, gradient norm = 0.0244  
iteration 2, gradient norm = 0.03491  
iteration 3, gradient norm = 0.01719  
iteration 4, gradient norm = 0.009969  
iteration 5, gradient norm = 0.01544  
iteration 6, gradient norm = 0.008387  
iteration 7, gradient norm = 0.003555  
iteration 8, gradient norm = 0.00342  
iteration 9, gradient norm = 0.004221  
iteration 10, gradient norm = 0.009147  
iteration 11, gradient norm = 0.006629  
iteration 12, gradient norm = 0.005035  
iteration 13, gradient norm = 0.002022  
iteration 14, gradient norm = 0.0008705  
iteration 15, gradient norm = 0.001229  
iteration 16, gradient norm = 0.001576  
iteration 17, gradient norm = 0.002142  
iteration 18, gradient norm = 0.001236  
iteration 19, gradient norm = 0.001034  
iteration 20, gradient norm = 0.0007226  
iteration 21, gradient norm = 0.0005405  
iteration 22, gradient norm = 0.0003375  
iteration 23, gradient norm = 0.0003066  
iteration 24, gradient norm = 0.0002752  
iteration 25, gradient norm = 0.0002666  
iteration 26, gradient norm = 0.0002408  
iteration 27, gradient norm = 0.0002133  
iteration 28, gradient norm = 0.0003022  
iteration 29, gradient norm = 0.0002584  
iteration 30, gradient norm = 0.000131  
iteration 31, gradient norm = 8.333e-05  
iteration 32, gradient norm = 5.511e-05  
iteration 33, gradient norm = 3.896e-05  
iteration 34, gradient norm = 3.07e-05  
iteration 35, gradient norm = 2.637e-05  
iteration 36, gradient norm = 3.188e-05  
iteration 37, gradient norm = 2.596e-05  
iteration 38, gradient norm = 2.556e-05  
iteration 39, gradient norm = 2.76e-05  
iteration 40, gradient norm = 4.201e-05  
iteration 41, gradient norm = 7.966e-05
```

```

iteration 42, gradient norm = 0.0002259
iteration 43, gradient norm = 0.0002154
iteration 44, gradient norm = 0.0001258
iteration 45, gradient norm = 0.0001605
iteration 46, gradient norm = 0.0001972
iteration 47, gradient norm = 0.0002837
iteration 48, gradient norm = 0.0004006
iteration 49, gradient norm = 0.0002623
iteration 50, gradient norm = 0.0002356
iteration 51, gradient norm = 0.0001351
iteration 52, gradient norm = 9.847e-05
iteration 53, gradient norm = 8.988e-05
iteration 54, gradient norm = 0.0001087
iteration 55, gradient norm = 6.307e-05
iteration 56, gradient norm = 5.333e-05
iteration 57, gradient norm = 4.568e-05
iteration 58, gradient norm = 4.551e-05
iteration 59, gradient norm = 5.132e-05
iteration 60, gradient norm = 4.374e-05
iteration 61, gradient norm = 2.322e-05
iteration 62, gradient norm = 2.312e-05
iteration 63, gradient norm = 1.51e-05
iteration 64, gradient norm = 1.23e-05
iteration 65, gradient norm = 6.683e-06
iteration 66, gradient norm = 3.046e-06
iteration 67, gradient norm = 2.416e-06
iteration 68, gradient norm = 1.281e-06
iteration 69, gradient norm = 8.383e-07
iteration 70, gradient norm = 8.521e-07
iteration 71, gradient norm = 8.997e-07
iteration 72, gradient norm = 6.157e-07
iteration 73, gradient norm = 3.629e-07
iteration 74, gradient norm = 2.975e-07
iteration 75, gradient norm = 2.821e-07
iteration 76, gradient norm = 2.416e-07
iteration 77, gradient norm = 1.84e-07
iteration 78, gradient norm = 1.655e-07
iteration 79, gradient norm = 1.897e-07
iteration 80, gradient norm = 1.205e-07
iteration 81, gradient norm = 5.665e-08
iteration 82, gradient norm = 3.608e-08
iteration 83, gradient norm = 7.045e-08
iteration 84, gradient norm = 6.343e-08
iteration 85, gradient norm = 3.933e-08
iteration 86, gradient norm = 2.265e-08
iteration 87, gradient norm = 2.197e-08
iteration 88, gradient norm = 1.468e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A27 with filename: A27_uevent_mark_PrepocDAll.set
Saving dataset...
Processing subject: A28 for folder 1
pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/1/A28_1_uevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A28 for folder 2

```

```

pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/2/A28_2_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Processing subject: A28 for folder 3
pop_loadset(): loading file ../nback_study_VR_EEG_data/A28/3/A28_3_upevent_mark_PrepocD1.set ...
eeg_insertbound(): 2 boundary (break) events added.
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
Merging datasets...
Warning: second dataset has empty urevent structure.
Concatenating events...
Adding boundary event...
Reconstituting epoch information...
eeg_checkset note: upper time limit (xmax) adjusted so (xmax-xmin)*srate+1 = number of frames
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Warning: duplicate boundary event removed
Event resorted by increasing latencies.
pop_eegfiltnew() - performing 415 point highpass filtering.
pop_eegfiltnew() - transition band width: 2 Hz
pop_eegfiltnew() - passband edge(s): 2 Hz
pop_eegfiltnew() - cutoff frequency(ies) (-6 dB): 1 Hz
pop_eegfiltnew() - filtering the data (zero-phase, non-causal)
firfilt(): |=====| 100%, ETE 00:00

```

```

Attempting to convert data matrix to double precision for more accurate ICA results.
iteration 1, gradient norm = 0.02591
iteration 2, gradient norm = 0.01516
iteration 3, gradient norm = 0.01185
iteration 4, gradient norm = 0.005331
iteration 5, gradient norm = 0.004921
iteration 6, gradient norm = 0.003967
iteration 7, gradient norm = 0.001886
iteration 8, gradient norm = 0.001094
iteration 9, gradient norm = 0.0009234
iteration 10, gradient norm = 0.0006925
iteration 11, gradient norm = 0.0005843
iteration 12, gradient norm = 0.0005331
iteration 13, gradient norm = 0.0004831
iteration 14, gradient norm = 0.0003222
iteration 15, gradient norm = 0.0002365
iteration 16, gradient norm = 0.000255
iteration 17, gradient norm = 0.0002011
iteration 18, gradient norm = 0.0001932
iteration 19, gradient norm = 0.0001751
iteration 20, gradient norm = 0.0001225
iteration 21, gradient norm = 7.585e-05
iteration 22, gradient norm = 5.241e-05
iteration 23, gradient norm = 3.892e-05
iteration 24, gradient norm = 1.615e-05
iteration 25, gradient norm = 1.133e-05
iteration 26, gradient norm = 9.211e-06
iteration 27, gradient norm = 6.684e-06

```

```

iteration 28, gradient norm = 3.29e-06
iteration 29, gradient norm = 2.337e-06
iteration 30, gradient norm = 1.652e-06
iteration 31, gradient norm = 1.206e-06
iteration 32, gradient norm = 8.508e-07
iteration 33, gradient norm = 6.706e-07
iteration 34, gradient norm = 5.885e-07
iteration 35, gradient norm = 6.211e-07
iteration 36, gradient norm = 5.215e-07
iteration 37, gradient norm = 3.609e-07
iteration 38, gradient norm = 3.086e-07
iteration 39, gradient norm = 2.072e-07
iteration 40, gradient norm = 1.718e-07
iteration 41, gradient norm = 1.107e-07
iteration 42, gradient norm = 9.63e-08
iteration 43, gradient norm = 5.875e-08
iteration 44, gradient norm = 4.246e-08
iteration 45, gradient norm = 2.838e-08
iteration 46, gradient norm = 2.288e-08
iteration 47, gradient norm = 1.031e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
1 components flagged for rejection, to reject them use Tools > Remove components from data
Computing projection and removing 1 components ....
Detecting flat line...
Scanning for bad channels...
clean_channel: 1/270 blocks, 0.0 minutes remaining.
clean_channel: 2/270 blocks, 0.0 minutes remaining.
clean_channel: 3/270 blocks, 0.0 minutes remaining.
clean_channel: 4/270 blocks, 0.0 minutes remaining.
clean_channel: 5/270 blocks, 0.0 minutes remaining.
clean_channel: 6/270 blocks, 0.0 minutes remaining.
clean_channel: 7/270 blocks, 0.0 minutes remaining.
clean_channel: 8/270 blocks, 0.0 minutes remaining.
clean_channel: 9/270 blocks, 0.0 minutes remaining.
clean_channel: 10/270 blocks, 0.0 minutes remaining.
clean_channel: 11/270 blocks, 0.0 minutes remaining.
clean_channel: 12/270 blocks, 0.0 minutes remaining.
clean_channel: 13/270 blocks, 0.0 minutes remaining.
clean_channel: 14/270 blocks, 0.0 minutes remaining.
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clean_channel: 19/270 blocks, 0.0 minutes remaining.
clean_channel: 20/270 blocks, 0.0 minutes remaining.
clean_channel: 21/270 blocks, 0.0 minutes remaining.
clean_channel: 22/270 blocks, 0.0 minutes remaining.
clean_channel: 23/270 blocks, 0.0 minutes remaining.
clean_channel: 24/270 blocks, 0.0 minutes remaining.
clean_channel: 25/270 blocks, 0.0 minutes remaining.
clean_channel: 26/270 blocks, 0.0 minutes remaining.
clean_channel: 27/270 blocks, 0.0 minutes remaining.
clean_channel: 28/270 blocks, 0.0 minutes remaining.
clean_channel: 29/270 blocks, 0.0 minutes remaining.
clean_channel: 30/270 blocks, 0.0 minutes remaining.
clean_channel: 31/270 blocks, 0.0 minutes remaining.
clean_channel: 32/270 blocks, 0.0 minutes remaining.

```



```
clean_channel: 225/270 blocks, 0.0 minutes remaining.
clean_channel: 226/270 blocks, 0.0 minutes remaining.
clean_channel: 227/270 blocks, 0.0 minutes remaining.
clean_channel: 228/270 blocks, 0.0 minutes remaining.
clean_channel: 229/270 blocks, 0.0 minutes remaining.
clean_channel: 230/270 blocks, 0.0 minutes remaining.
clean_channel: 231/270 blocks, 0.0 minutes remaining.
clean_channel: 232/270 blocks, 0.0 minutes remaining.
clean_channel: 233/270 blocks, 0.0 minutes remaining.
clean_channel: 234/270 blocks, 0.0 minutes remaining.
clean_channel: 235/270 blocks, 0.0 minutes remaining.
clean_channel: 236/270 blocks, 0.0 minutes remaining.
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clean_channel: 239/270 blocks, 0.0 minutes remaining.
clean_channel: 240/270 blocks, 0.0 minutes remaining.
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clean_channel: 242/270 blocks, 0.0 minutes remaining.
clean_channel: 243/270 blocks, 0.0 minutes remaining.
clean_channel: 244/270 blocks, 0.0 minutes remaining.
clean_channel: 245/270 blocks, 0.0 minutes remaining.
clean_channel: 246/270 blocks, 0.0 minutes remaining.
clean_channel: 247/270 blocks, 0.0 minutes remaining.
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clean_channel: 249/270 blocks, 0.0 minutes remaining.
clean_channel: 250/270 blocks, 0.0 minutes remaining.
clean_channel: 251/270 blocks, 0.0 minutes remaining.
clean_channel: 252/270 blocks, 0.0 minutes remaining.
clean_channel: 253/270 blocks, 0.0 minutes remaining.
clean_channel: 254/270 blocks, 0.0 minutes remaining.
clean_channel: 255/270 blocks, 0.0 minutes remaining.
clean_channel: 256/270 blocks, 0.0 minutes remaining.
clean_channel: 257/270 blocks, 0.0 minutes remaining.
clean_channel: 258/270 blocks, 0.0 minutes remaining.
clean_channel: 259/270 blocks, 0.0 minutes remaining.
clean_channel: 260/270 blocks, 0.0 minutes remaining.
clean_channel: 261/270 blocks, 0.0 minutes remaining.
clean_channel: 262/270 blocks, 0.0 minutes remaining.
clean_channel: 263/270 blocks, 0.0 minutes remaining.
clean_channel: 264/270 blocks, 0.0 minutes remaining.
clean_channel: 265/270 blocks, 0.0 minutes remaining.
clean_channel: 266/270 blocks, 0.0 minutes remaining.
clean_channel: 267/270 blocks, 0.0 minutes remaining.
clean_channel: 268/270 blocks, 0.0 minutes remaining.
clean_channel: 269/270 blocks, 0.0 minutes remaining.
clean_channel: 270/270 blocks, 0.0 minutes remaining.
Removing 1 channel(s)...
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
Event resorted by increasing latencies.
Finding a clean section of the data...
Determining time window rejection thresholds...done.
Keeping 88.6% (1197 seconds) of the data.
eeg_insertbound(): 94 boundary (break) events added.
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
eeg_checkset note: event field format 'binlabel' made uniform
eeg_checkset note: event field format 'codelabel' made uniform
Event resorted by increasing latencies.
Event resorted by increasing latencies.
Estimating calibration statistics; this may take a while...
Determining per-component thresholds...done.
Now cleaning data in 96 blocks.....
Event resorted by increasing latencies.
```

```
Now doing final post-cleanup of the output.  
Determining time window rejection thresholds...done.  
Keeping 100.0% (1352 seconds) of the data.  
Event resorted by increasing latencies.  
Use vis_artifacts to compare the cleaned data to the original.  
Done.  
Keeping this many channels:  
17  
Interpolating 2 channels...  
Warning: some channels have the same label  
Re-referencing data  
Removing 2 channel(s)...  
Event resorted by increasing latencies.  
Re-referencing ICA matrix  
  
Saving current ICA decomposition in "EEG/etc.oldicaweights" (etc.).  
Decomposition saved as entry 1.  
Attempting to convert data matrix to double precision for more accurate ICA results.  
Warning: fixing rank computation inconsistency (17 vs 16) most likely because running under Linux 64-bit M  
iteration 1, gradient norm = 0.01533  
iteration 2, gradient norm = 0.01731  
iteration 3, gradient norm = 0.02731  
iteration 4, gradient norm = 0.01602  
iteration 5, gradient norm = 0.01617  
iteration 6, gradient norm = 0.005165  
iteration 7, gradient norm = 0.005663  
iteration 8, gradient norm = 0.007786  
iteration 9, gradient norm = 0.003761  
iteration 10, gradient norm = 0.002605  
iteration 11, gradient norm = 0.001665  
iteration 12, gradient norm = 0.001921  
iteration 13, gradient norm = 0.001136  
iteration 14, gradient norm = 0.0006006  
iteration 15, gradient norm = 0.0007864  
iteration 16, gradient norm = 0.0005874  
iteration 17, gradient norm = 0.0003993  
iteration 18, gradient norm = 0.0002047  
iteration 19, gradient norm = 9.909e-05  
iteration 20, gradient norm = 8.904e-05  
iteration 21, gradient norm = 5.227e-05  
iteration 22, gradient norm = 2.97e-05  
iteration 23, gradient norm = 2.711e-05  
iteration 24, gradient norm = 2.513e-05  
iteration 25, gradient norm = 2.098e-05  
iteration 26, gradient norm = 1.745e-05  
iteration 27, gradient norm = 1.186e-05  
iteration 28, gradient norm = 9.724e-06  
iteration 29, gradient norm = 8.139e-06  
iteration 30, gradient norm = 6.728e-06  
iteration 31, gradient norm = 4.715e-06  
iteration 32, gradient norm = 2.94e-06  
iteration 33, gradient norm = 2.244e-06  
iteration 34, gradient norm = 1.506e-06  
iteration 35, gradient norm = 1.066e-06  
iteration 36, gradient norm = 7.621e-07  
iteration 37, gradient norm = 5.229e-07  
iteration 38, gradient norm = 3.473e-07  
iteration 39, gradient norm = 2.335e-07  
iteration 40, gradient norm = 1.348e-07  
iteration 41, gradient norm = 1.048e-07  
iteration 42, gradient norm = 1.004e-07  
iteration 43, gradient norm = 8.39e-08  
iteration 44, gradient norm = 8.384e-08  
iteration 45, gradient norm = 8.667e-08
```

```

iteration 46, gradient norm = 7.001e-08
iteration 47, gradient norm = 4.653e-08
iteration 48, gradient norm = 2.481e-08
iteration 49, gradient norm = 2.303e-08
iteration 50, gradient norm = 2.022e-08
iteration 51, gradient norm = 1.64e-08
iteration 52, gradient norm = 1.357e-08
iteration 53, gradient norm = 1.102e-08
Scaling components to RMS microvolt
eeg_checkset: recomputing the ICA activation matrix ...
ICLabel: extracting features...
ICLabel: calculating labels...
Failed to run ICLabel. Trying to compile MEX-files.
MEX-file compilation failed. Further instructions on compiling the MEX-files can be found at http://www.v
Warning: ICLabel: defaulting to uncompiled matlab code (about 80x slower)
ICLabel: saving results...
0 components flagged for rejection, to reject them use Tools > Remove components from data
Saving data for A28 with filename: A28_uevent_mark_PrepocDAll.set
Saving dataset...

```

HERE

Phase 3: Epoch data based on the condition

This is an n-back task, so a continuous stream of information is presented with the 'prob' (probe) acting as both a stimulus and a probe. Here is the timing:

blank to probe: 3 seconds

probe to feedback: 3 seconds

feedback to blank: 3 seconds

It generally seems inappropriate to do baseline correction (unless it's done before the stimuli even start, because otherwise the participant is holding items in their working memory).

Most likely, we will just break into 3 second epochs for each condition starting right at the marker time.

OLD: Based on advice in (https://sccn.ucsd.edu/wiki/Makoto%27s_preprocessing_pipeline#High-pass_filter_the_data_at_1-Hz_.28for_ICA.2C_ASR.2C_and_CleanLine.29.2805.2F18.2F2022_updated.29), we are going to keep this as one .set file for each subject with the conditions inside.

```

for s = 1:length(subjNames)
    subjName = subjNames{s};
    fprintf("Processing subject: %s \n", subjName)

    % Make output directory if it doesn't already exist
    if ~exist(strcat(options.saveToPhase3,subjName),'dir')
        mkdir(strcat(options.saveToPhase3,subjName))
    end

```

Load the data

```
try
    EEG =
pop_loadset('filename', strcat(options.prefixPhase2, options.preprocessingTag,
'_', subjName, '.set'), 'filepath', options.saveToPhase2);
catch SE
    input(strcat("Error loading dataset for ", subjName))
    SE
end

EEG = pop_epoch( EEG, conditions, options.epochWindow, 'newname',
'epochs for all cond', 'epochinfo', 'yes');
% Remove baseline for the whole long trial
if options.removebaseline
    % Remove 500 ms baseline
    EEG = pop_rmbase( EEG, [options.epochWindow(1) 0] , [] );
end
```

Remove incorrect trials

```
disp('Number of trials before removing incorrect: ')
disp(num2str(sum([EEG.event.correct])))
EEG = pop_selectevent( EEG,
'correct', 1, 'deleteevents', 'off', 'deleteepochs', 'on', 'invertepochs', 'off');
disp('Number of trials after removing incorrect: ')
disp(num2str(sum([EEG.event.correct])))
EEG = eeg_checkset(EEG);
```

Save the data

```
EEG =
pop_saveset(EEG, 'filename', strcat(options.prefixPhase3, '_', options.prefixPhase2,
options.preprocessingTag, '_', subjName), 'filepath', strcat(options.saveToPhase3, subjName));
```

Epoch again for all stim types separately and save with a different name

```
EEG = pop_epoch( EEG, options.eventTypes, [-0.5 2.0], 'newname',
'epochs for all events', 'epochinfo', 'yes');

% Create counts of events

eventType = {EEG.event.type}
for eT = 1:length(options.eventTypes)
```

```

    subjeventsClean(s,eT) =
sum(strcmp(eventType,options.eventTypes{eT}));
end

% Make output directory if it doesn't already exist
if ~exist(strcat(options.saveToPhase4,subjName),'dir')
    mkdir(strcat(options.saveToPhase4,subjName))
end
EEG =
pop_saveset(EEG,'filename',strcat(options.prefixPhase4,options.prefixPhase3,
'_',options.prefixPhase2,options.preprocessingTag,'_',subjName),'filepath',s
trcat(options.saveToPhase4,subjName));
fprintf(strcat("Saving data for ", subjName, " with filename: " ,
temp_filename_out,"\\n"))
EEG =
pop_saveset(EEG,'filename',temp_filename_out,'filepath',temp_subj_folder_joi
nt);

end
%save(strcat(options.saveToPhase4,'subjectConditionCountPreproc',options.pre
processingTag,'.mat'),"subjeventsClean","subjNames","options")

```