## Additional information on the EEG data which is put available on the BIOMED website

## Matlab code

function **eegplot**(S,meas,sens,linestyle)
%EEGPLOT    plots a multi-channel data set
%   eegplot(S,meas,sens,linestyle)
%   S is a matrix with m rows (channels) and n coloms (timesamples)
%   meas is the montage used (optional)
%   sens is the y-axes scale (optional)
%   linestyle (optional)

**meas19chch**: longitudinal montage used to review epileptic events. This data structure can be fed into eegplot.

**elpos19chch** : A two-column matrix containing theta and phi in radials. The standard electrode positions on a spherical head model of the 19 electrodes. This information is necessary when performing EEG source localization.

```
% |        |z
% |        |
% |        | th /
% |        |-->/
% |        | /
% |        | /        y
% |        |/-----------
% |        /\
% |       /  \
% |      /`-->\
% |     / phi  \
% |    /
% |   /x
```

The rows represent the following electrodes:
'Fp1'  'Fp2'  'F3'  'F4'  'C3'  'C4'  'P3'  'P4'  'O1'  'O2'  'F7'  'F8'  'T3'  'T4'
'T5'  'T6'  'Fz'  'Cz'  'Pz'
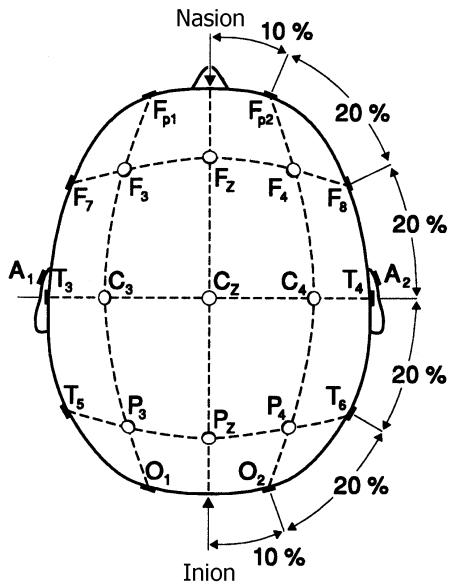
Matlab code on ICA and EEG source localization can be found on the open source package EEGLAB: http://sccn.ucsd.edu/eeglab/

**Interictal EEG**

Raw data stored with an average reference i.e. sum of all channels equals zero for each time sample.
Sample frequency 256 Hz
**spike1.mat** : Is a 19 x 1281 matrix. The rows represent the 19 channels (see above for order); the columns represent the time samples.
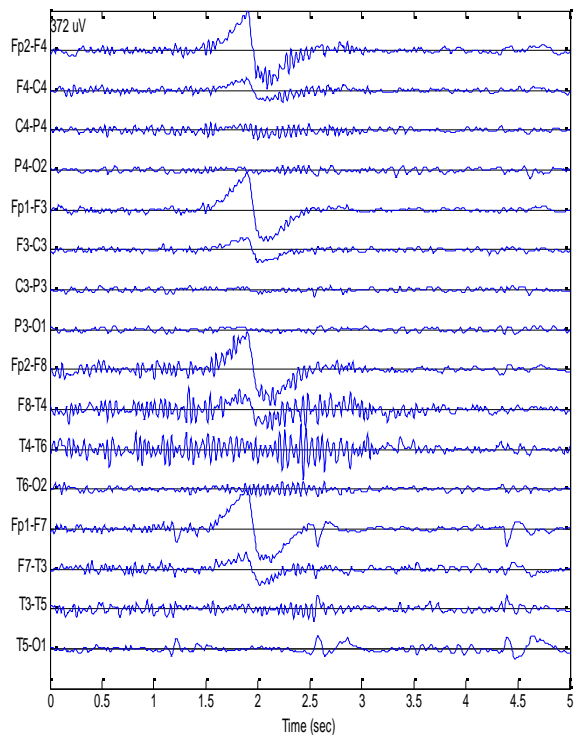>>eegplot(sig_av,meas19chch)
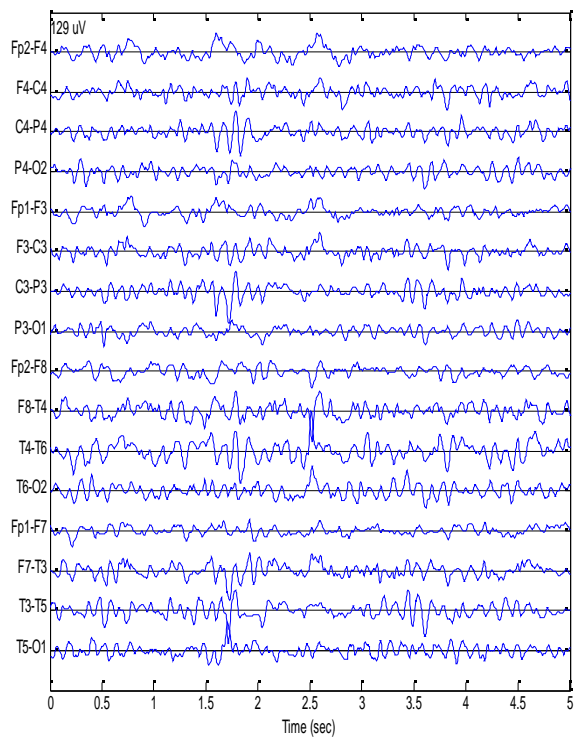
Two epileptic transients can be observed, one at 1.6 s on channels T3-T5 and T5-O1, both peaks are pointing to each other, and one at 2.5 s at channels F8-T4 and T4-T6.

**spike2.mat**: Is a 19 x 1281 matrix as above.
>>eegplot(sig_av,meas19chch)

At 1.8 s an eye-blink or eye-movement artifacts occurs mainly on channels Fp2-F4, Fp1-F3, Fp2-F8 and Fp1-F7. These are channels in the vicinity of the eyes. Epileptic transients are noticed at 2.5s and 4.4s on the channels Fp1-F7 and T5-O1. We also observe runs of high frequency activity mainly on channels T4-T6 and F8-T4. This signal may be due to muscle activity or due to 50 Hz power line disturbance.

## Ictal EEG

**Matlab code:**

```
function eegplotavr(S,meas,sens,linestyle)
%EEGPLOTAVR   plots a multi-channel data set in an average reference montage
%   eegplotavr(S,meas,sens,linestyle)
%   S is a matrix with m rows (channels) and n coloms (timesamples)
%   meas is the montage used (optional)
%   sens is the y-axes scale (optional)
%   linestyle (optional)
```

**meas21avr:** average reference montage used to review epileptic seizures. This data structure can be fed into eegplotavr.

**sig_ictal.mat:** Is a 21 x 2500 matrix. The rows represent the 21 channels; the columns represent the time samples. The sampling frequency is 250 Hz.
>>eegplotavr(sig_ictal,meas21avr,100)
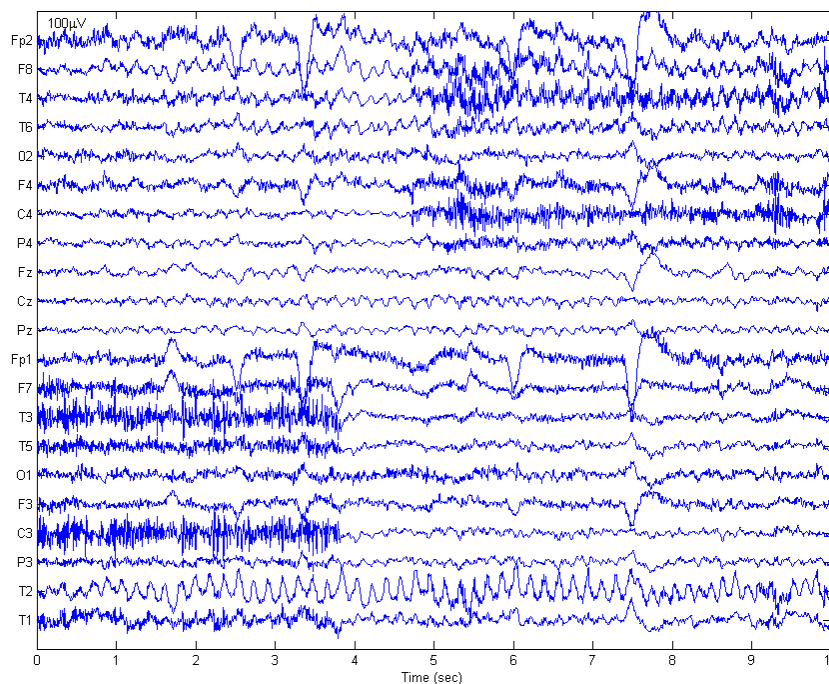


Epileptic seizure activity can be observed on channels T2, F8, T4 and T6. At 2.5 s, 3.4 s, 6 s, 7.6 s eye blinks occur. Muscle artifacts can be observed between 0 s - 3.9 s on

channels F7, T3, T5, C3, T1 and between 5 s - 10 s on channels F8, T4, F4, C4 and P4.