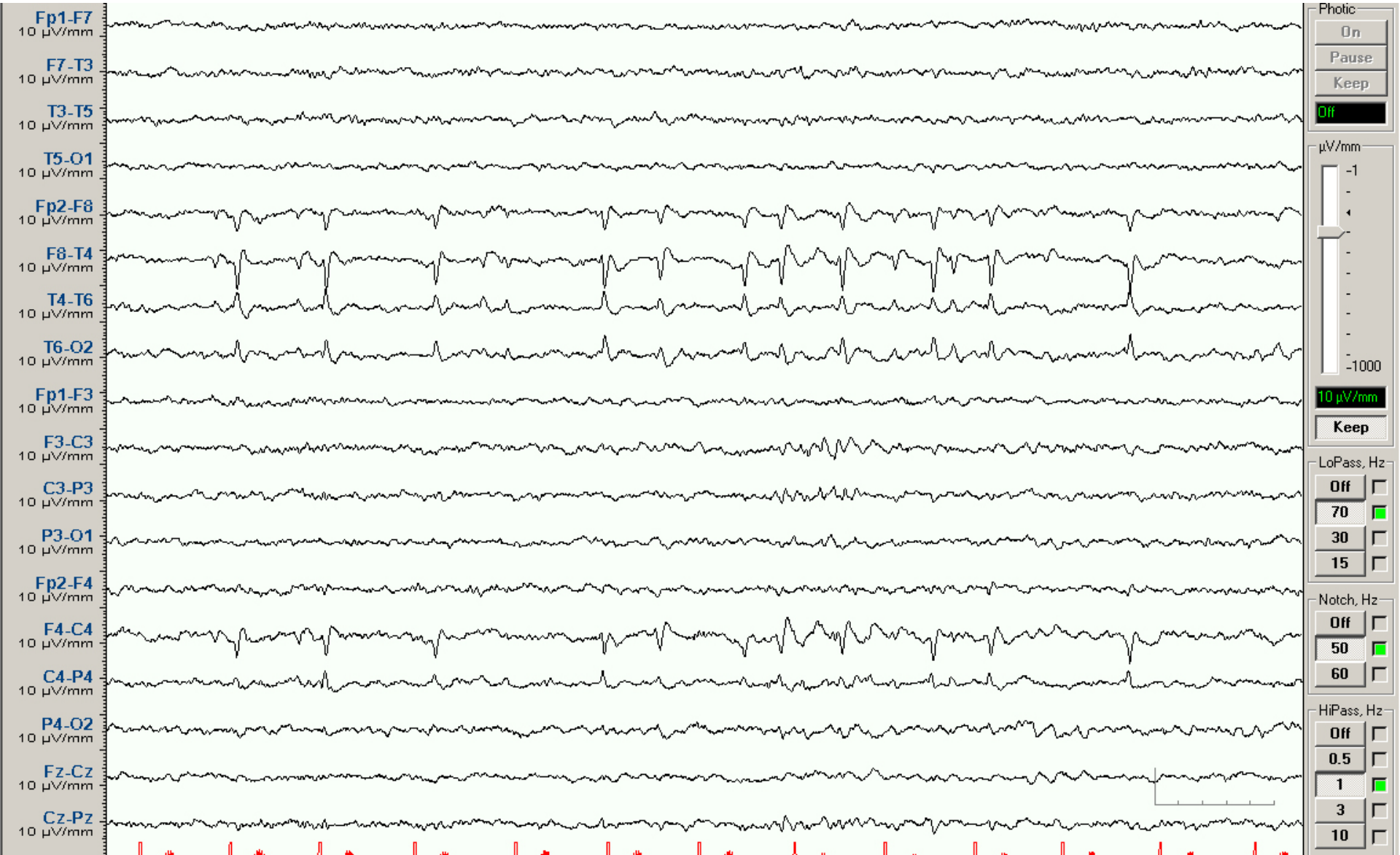
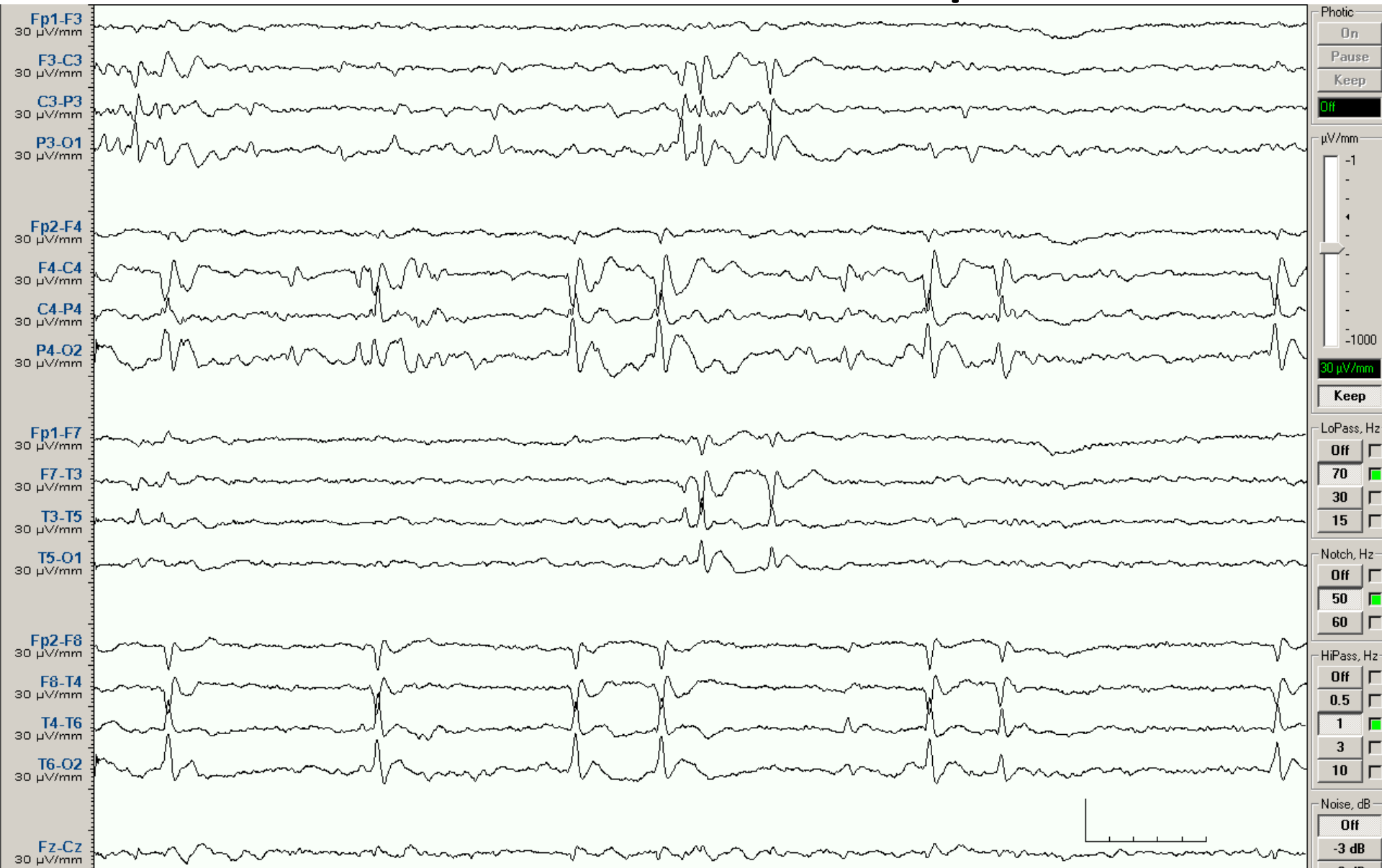
BECTS

- Onset : 3-14 years (Peak 5-8)
- Seizure type : hemiface (motor and sensory)
  : secondarily during sleep
- Interictal EEG : Diphasic slow spikes
- Ictal EEG :
- Causes : Genetics?
- Course : Benign
- Treatment : May not need if infrequent

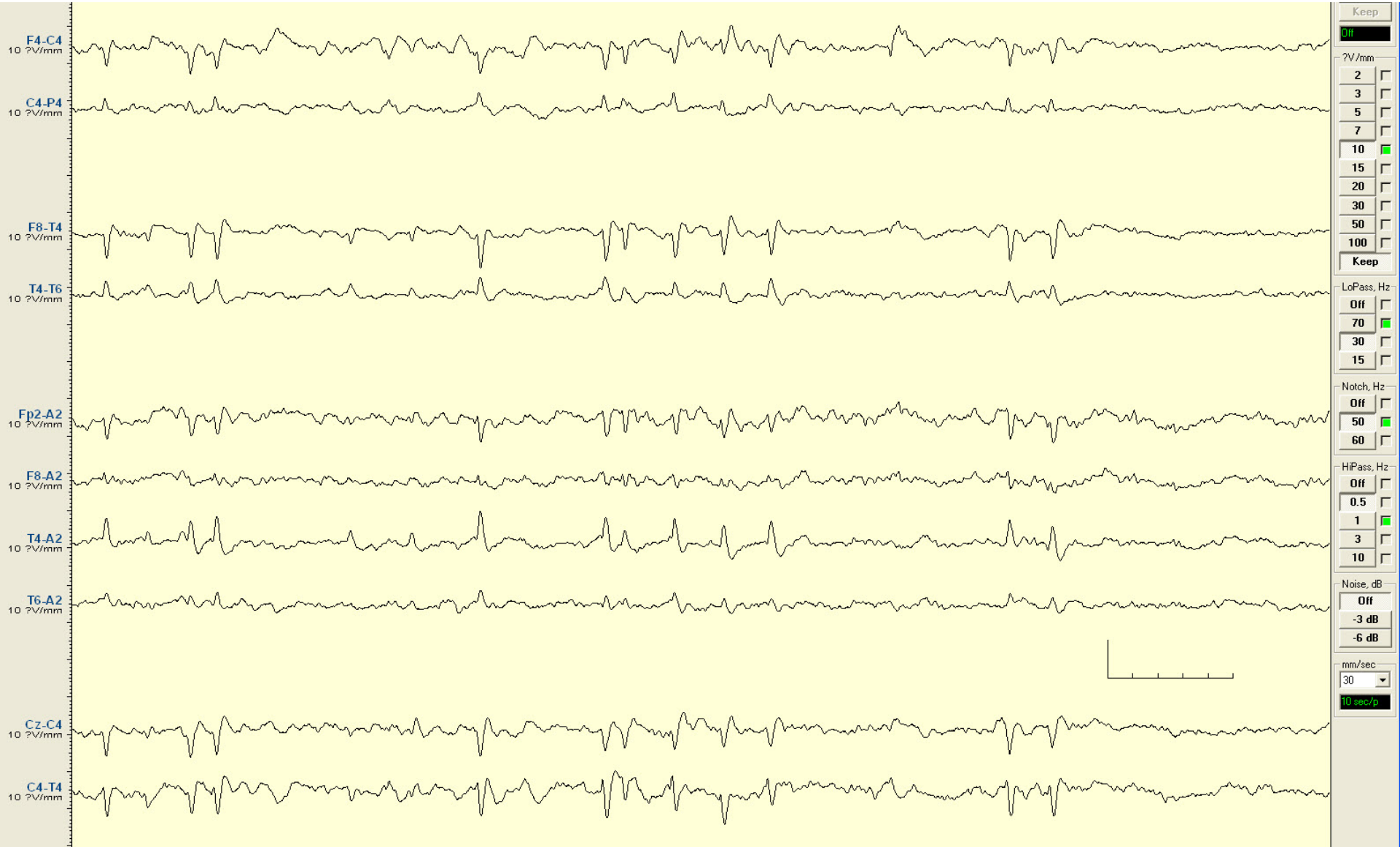
Unilateral centro-temporal



Bilateral centro-temporal



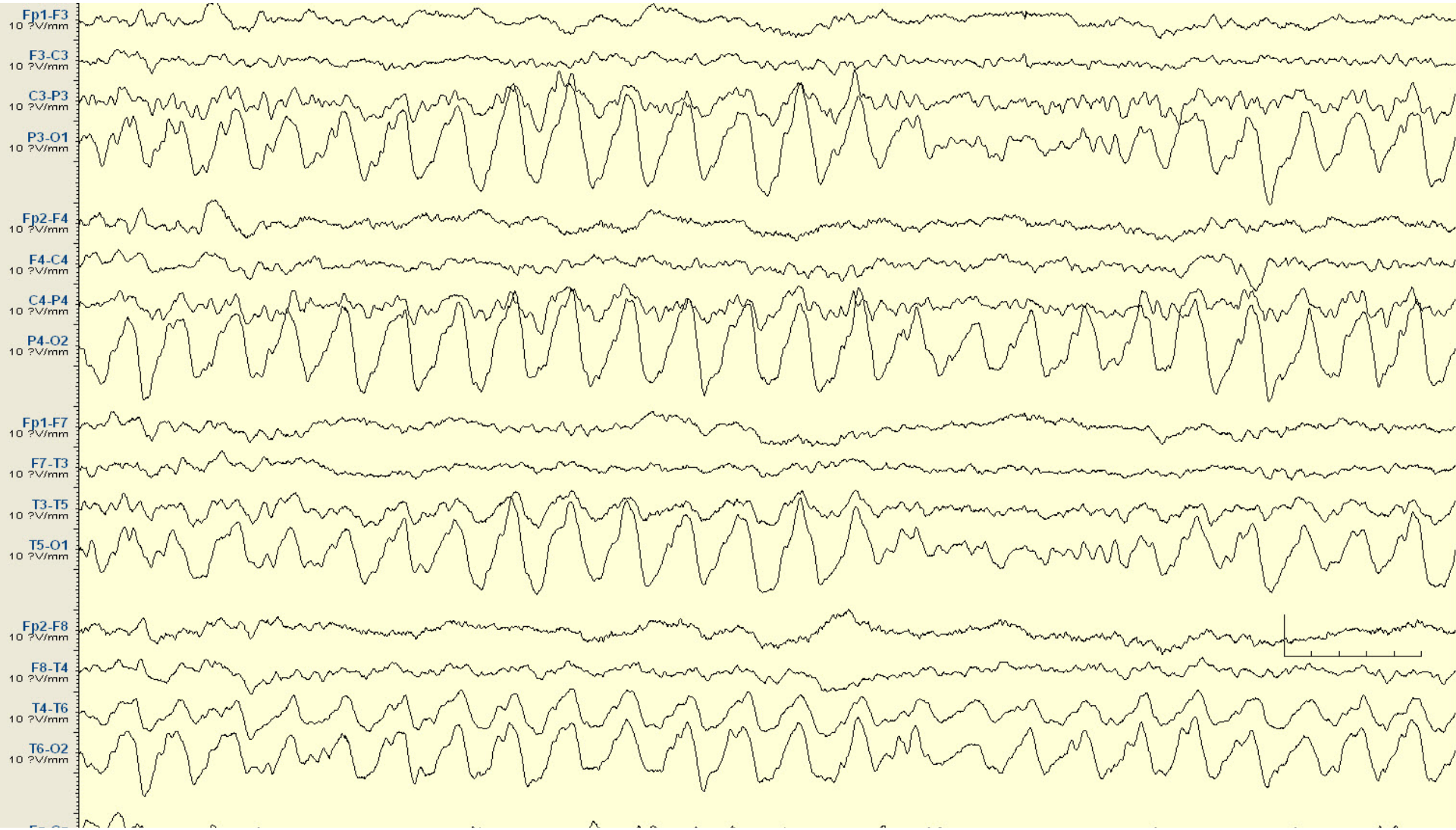
Tangential dipole on reference



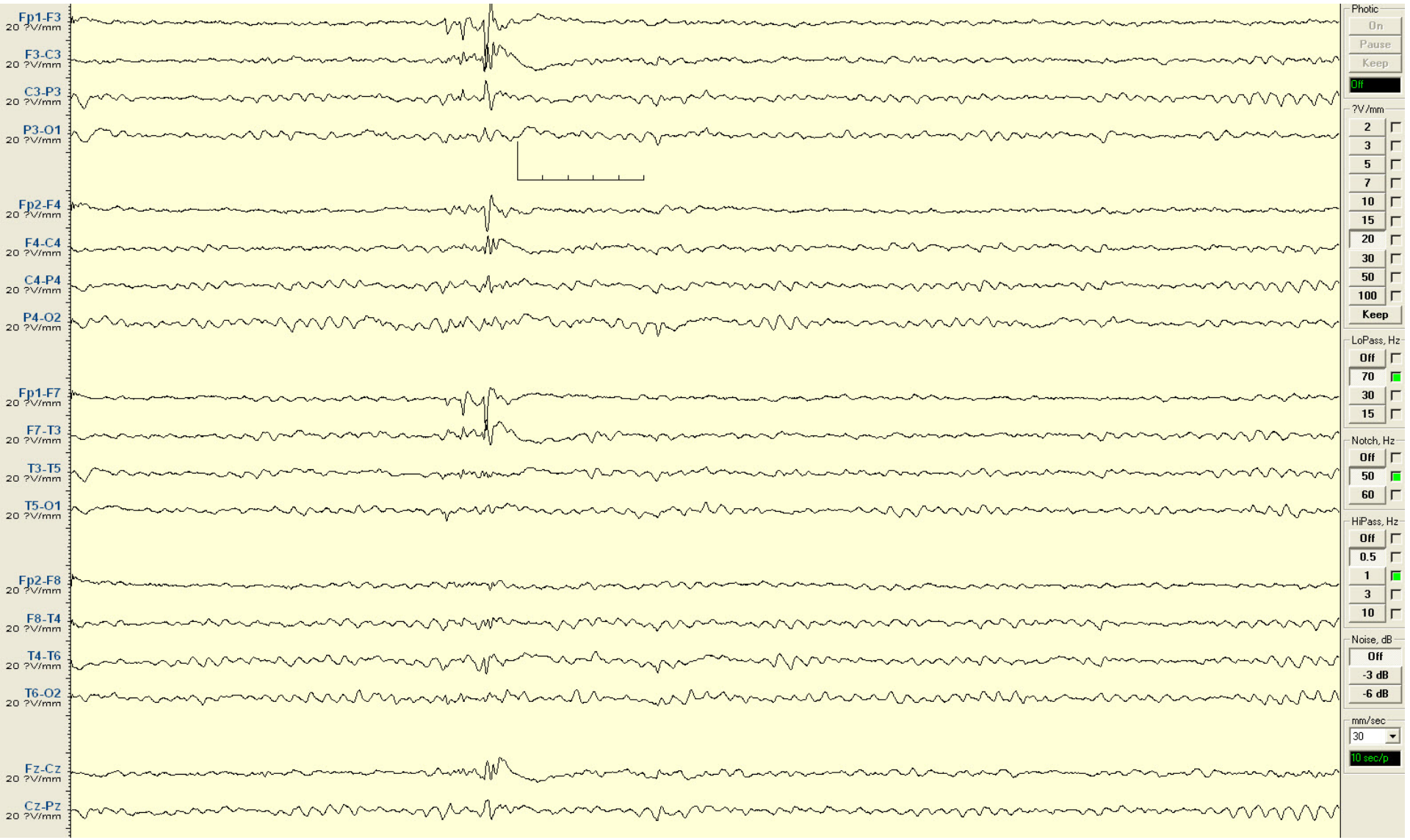
Childhood absence

- Onset : Peak 6-7 years
- Seizure type : Absence
- Interictal EEG : Normal Background,
- Ictal EEG : 3-Hz spike-wave complex
- Causes : Genetics?
- Course : Benign
- Treatment : VPA, LTG, TPM, LEV

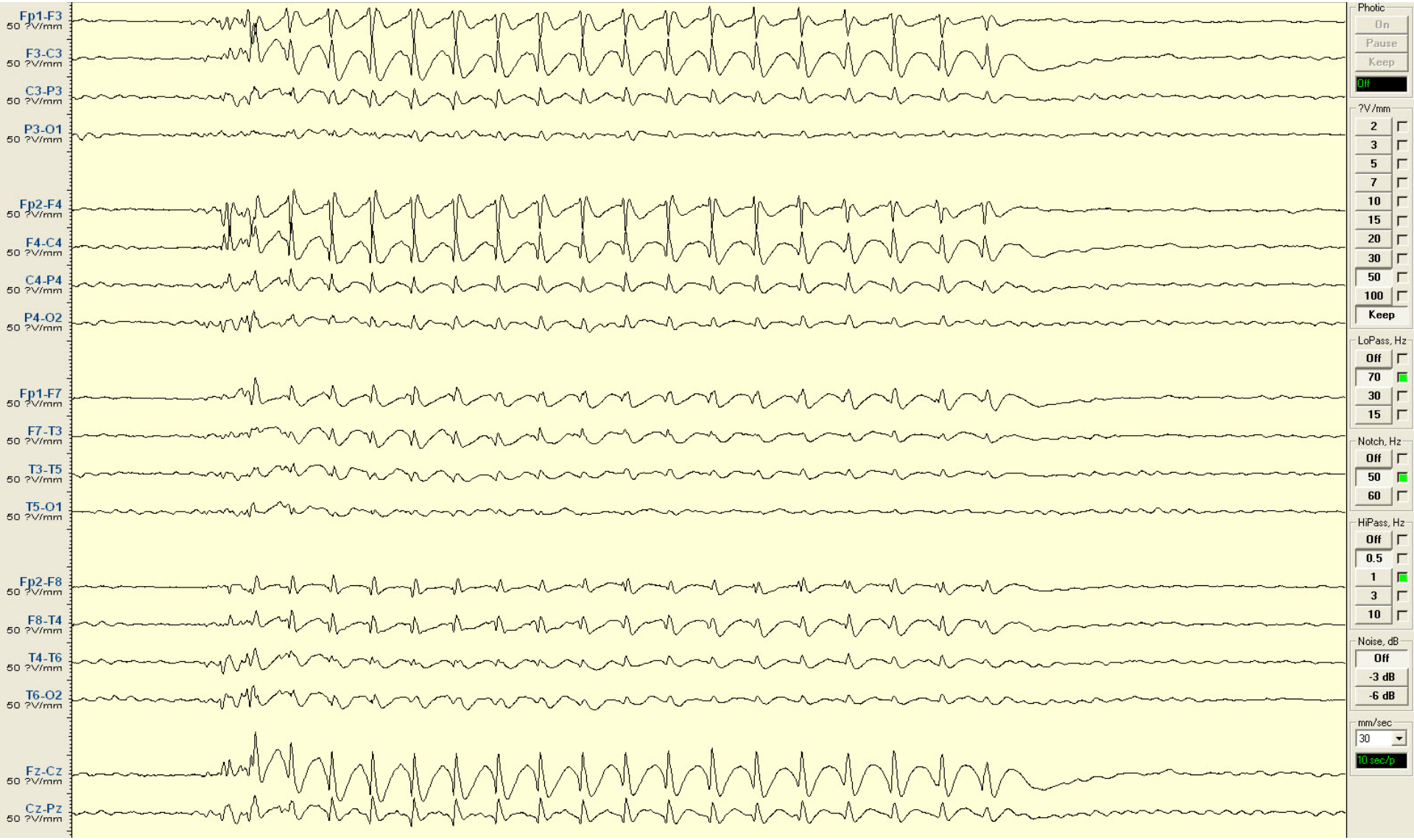
OIRDA during awake



Fragmented PSW during sleep



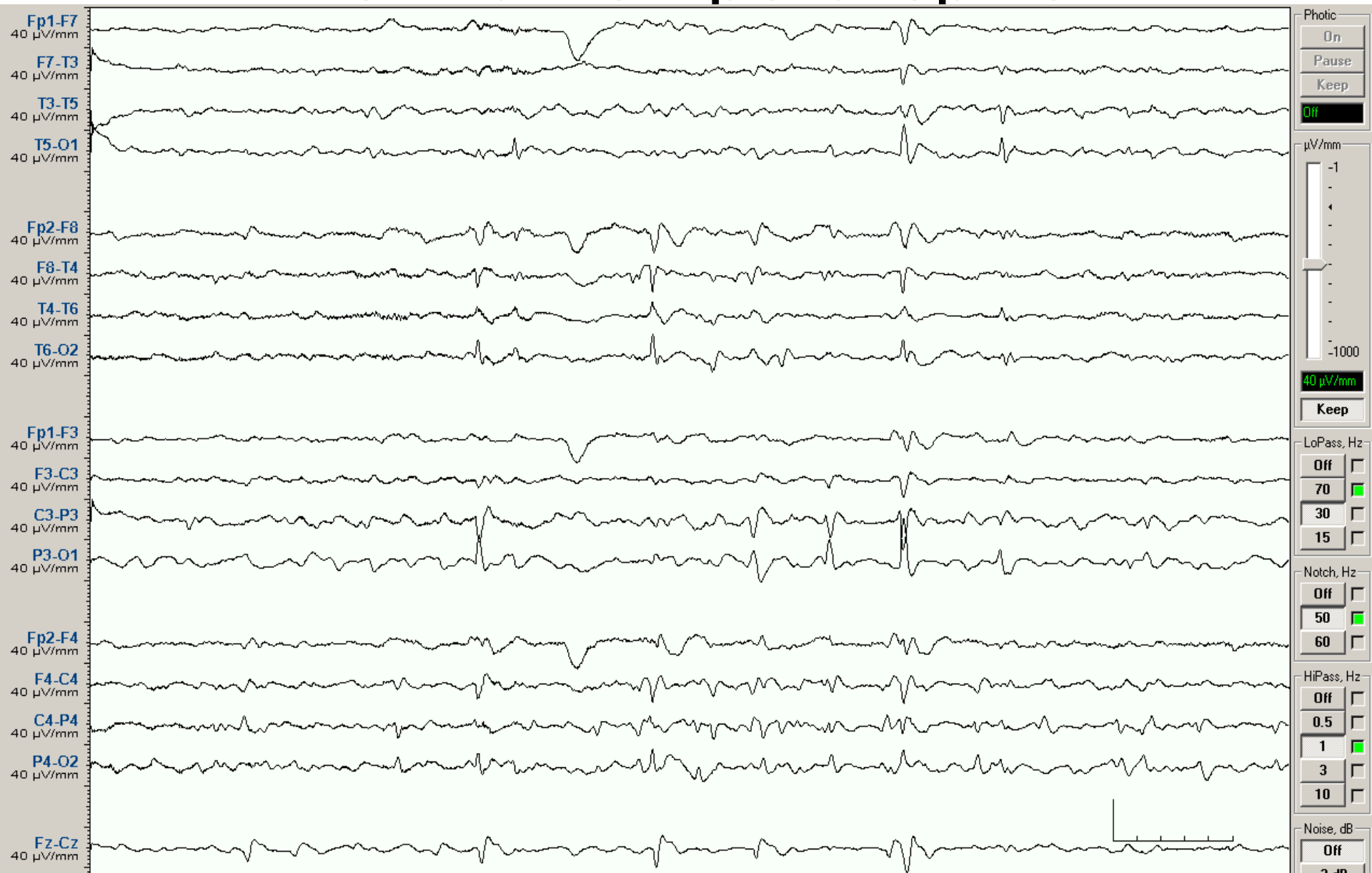
Typical attack



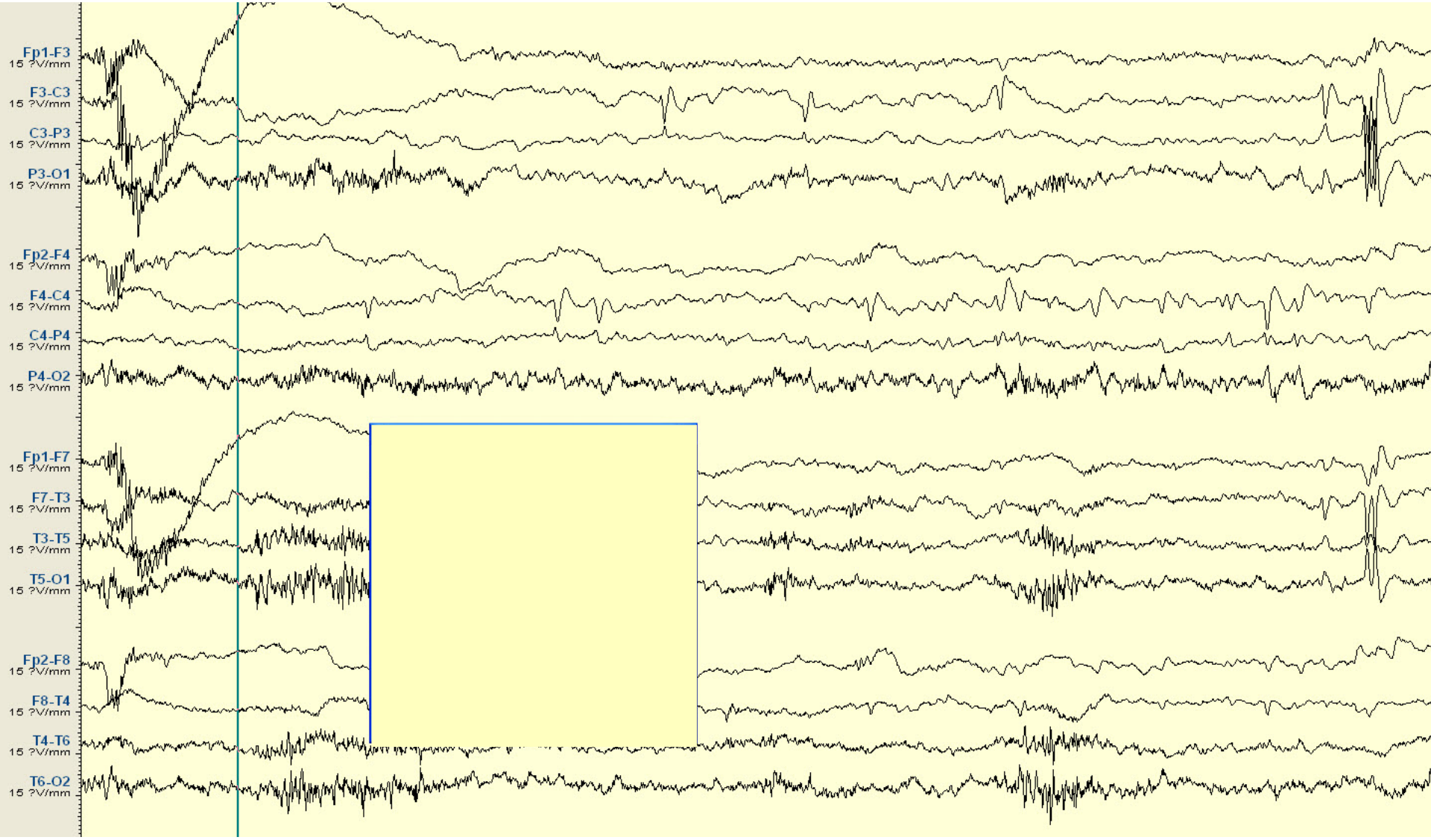
Landau-Kleffner (Acquired epileptic aphasia)

- Onset : 2-8 years (Peak 5-7)
- Seizure type : Auditory agnosia
  : Nocturnal seizure (Gen, focal)
- Interictal EEG : Awake: Normal
  : Sleep: Repetitive spike-wave, more over the temporal
- Ictal EEG :
- Causes : Immune process?
- Course : Variable
- Treatment : AED + corticosteroid, IVIG

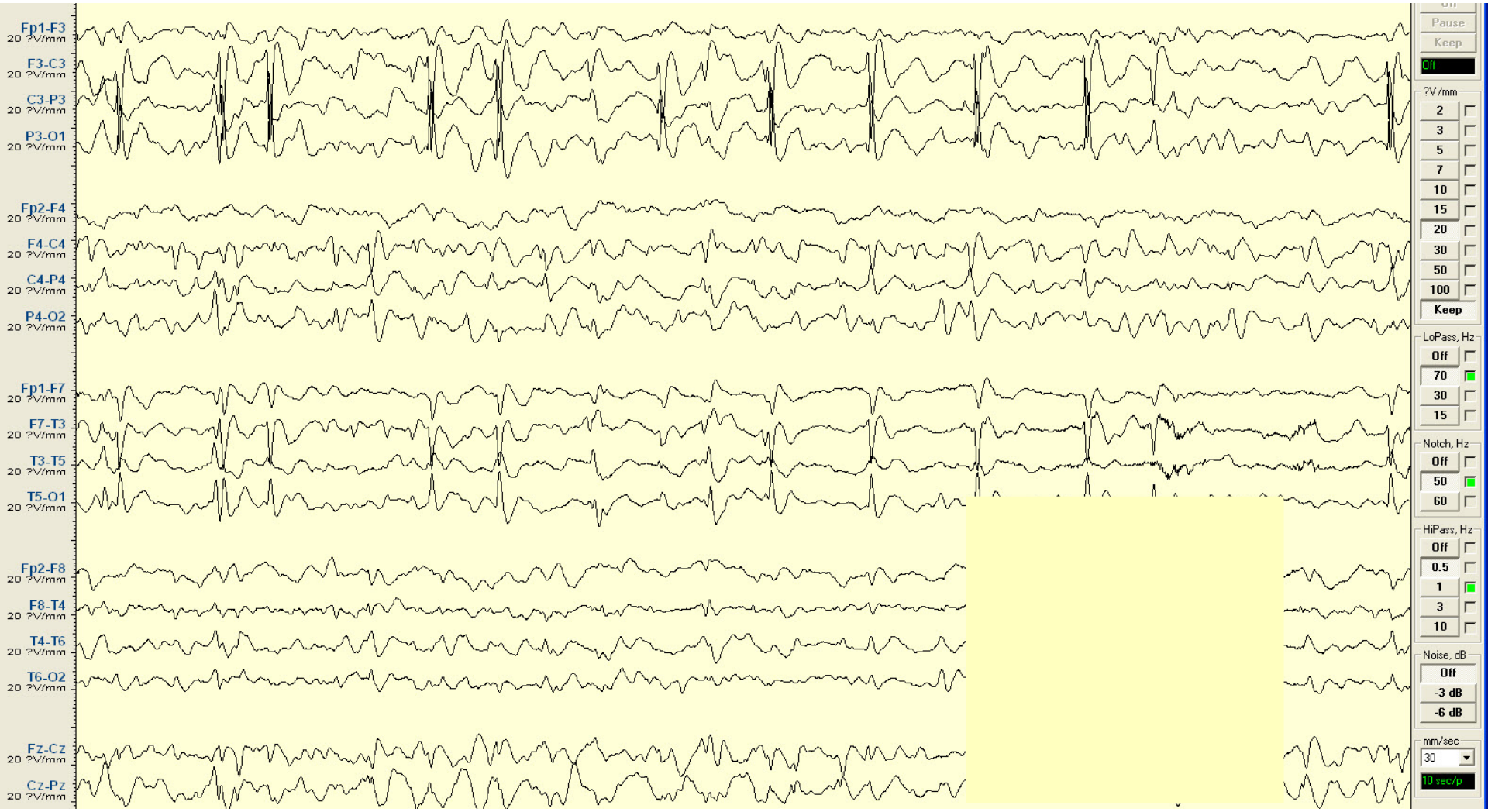
Central-temporal spike



Awake EEG


Fp1-F3
15 ?V/mm
F3-C3
15 ?V/mm
C3-P3
15 ?V/mm
P3-O1
15 ?V/mm
Fp2-F4
15 ?V/mm
F4-C4
15 ?V/mm
C4-P4
15 ?V/mm
P4-O2
15 ?V/mm
Fp1-F7
15 ?V/mm
F7-T3
15 ?V/mm
T3-T5
15 ?V/mm
T5-O1
15 ?V/mm
Fp2-F8
15 ?V/mm
F8-T4
15 ?V/mm
T4-T6
15 ?V/mm
T6-O2
15 ?V/mm

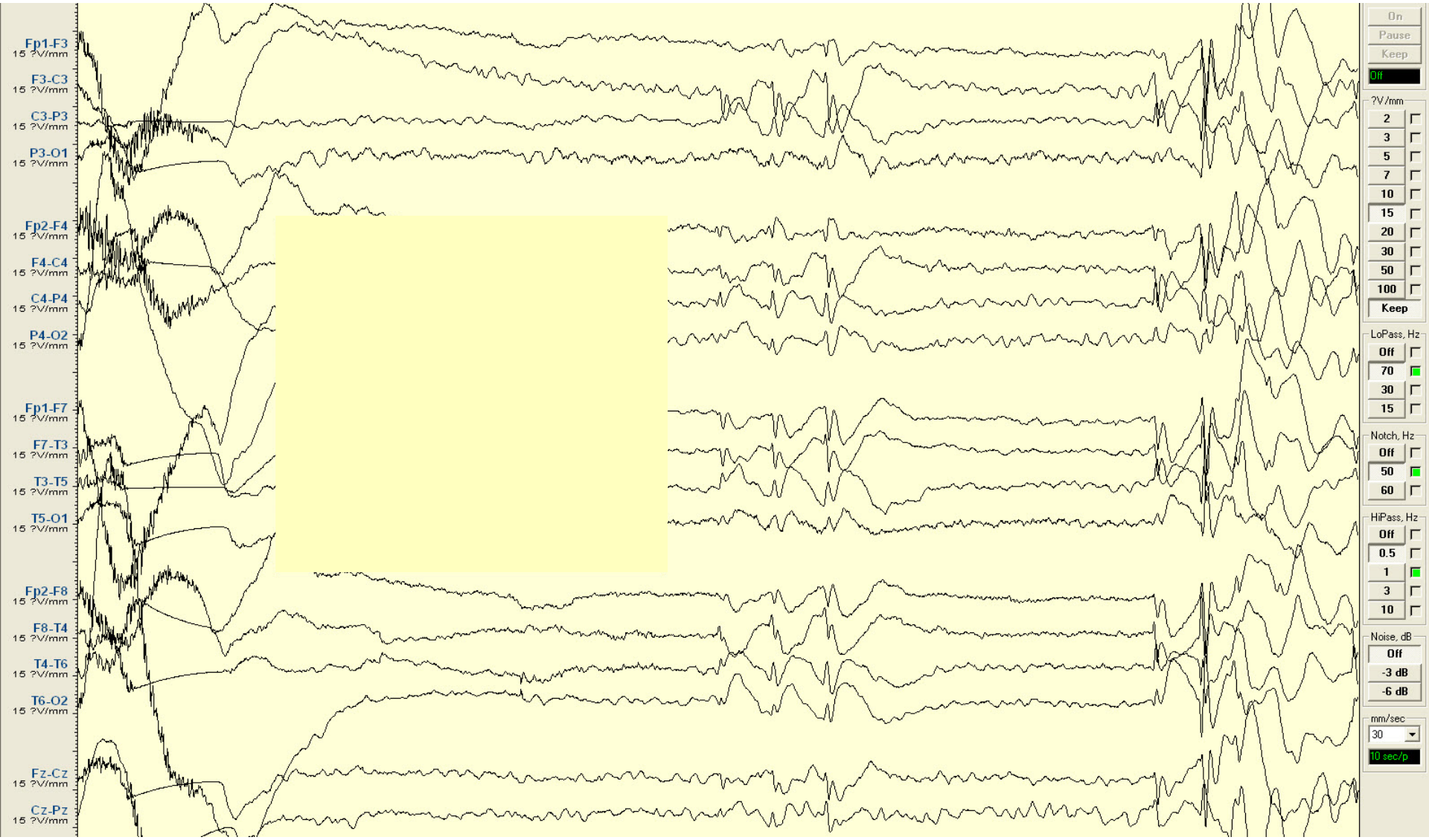
Sleep EEG


Fp1-F3
20 ?V/mm
F3-C3
20 ?V/mm
C3-P3
20 ?V/mm
P3-O1
20 ?V/mm
Fp2-F4
20 ?V/mm
F4-C4
20 ?V/mm
C4-P4
20 ?V/mm
P4-O2
20 ?V/mm
Fp1-F7
20 ?V/mm
F7-T3
20 ?V/mm
T3-T5
20 ?V/mm
T5-O1
20 ?V/mm
Fp2-F8
20 ?V/mm
F8-T4
20 ?V/mm
T4-T6
20 ?V/mm
T6-O2
20 ?V/mm
Fz-Cz
20 ?V/mm
Cz-Pz
20 ?V/mm
Pause
Keep
Off
?V/mm
2
3
5
7
10
15
20
30
50
100
Keep
LoPass, Hz
Off
70
30
15
Notch, Hz
Off
50
60
HiPass, Hz
Off
0.5
1
3
10
Noise, dB
Off
-3 dB
-6 dB
mm/sec
30
10 sec/p

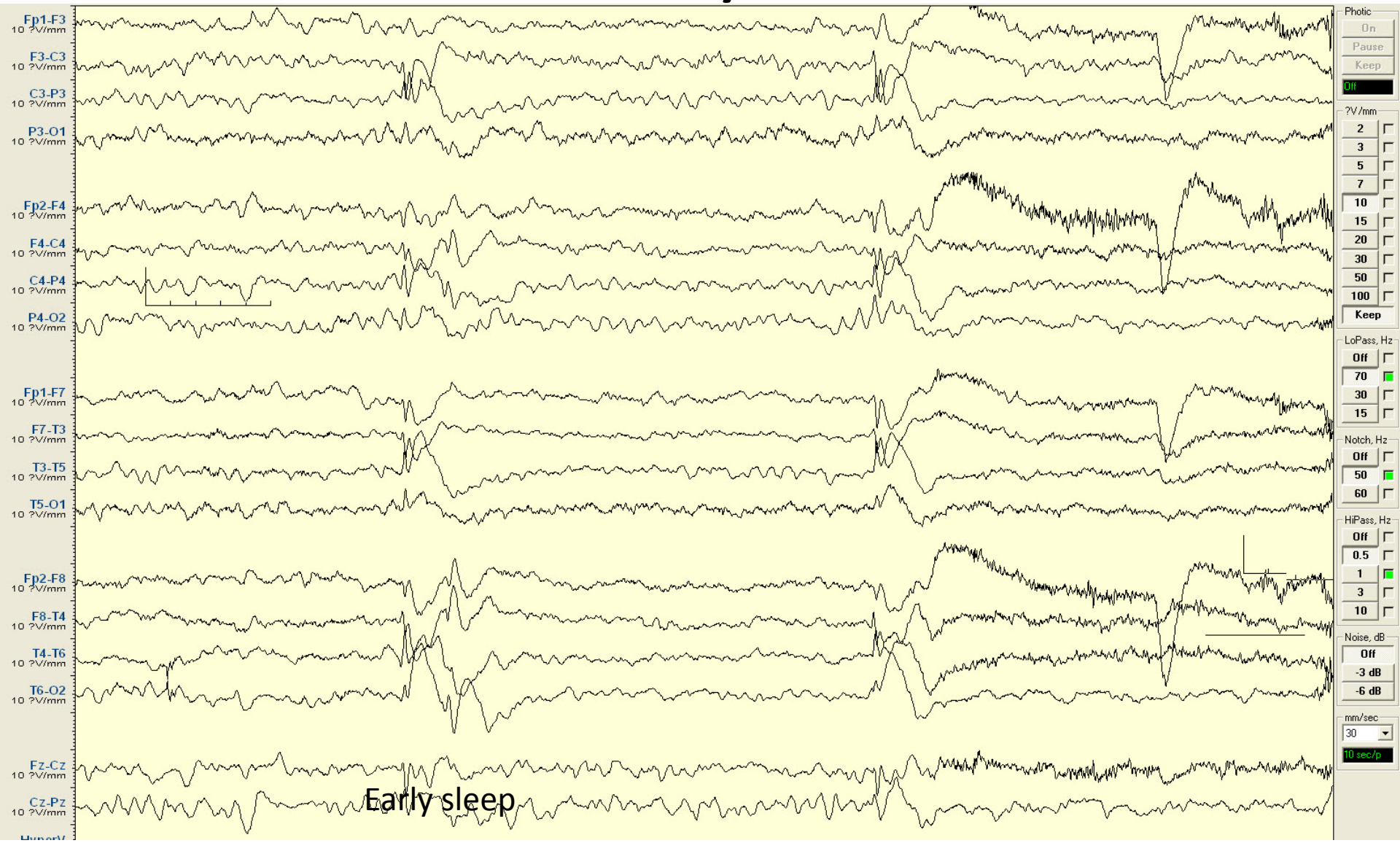
ESES or CSWS

- Onset : Peak 4-5 years
- Seizure type : neuropsychological/motor impairment as a major features
  : Epilepsy (focal, generalized)
- Interictal EEG : Awake: normal
  : Sleep: continuous diffuse spike-wave complex
- Causes : Immune?
- Course : Variable, generally poor
- Treatment : AED + steroid/ IVIG/ Sx

Awake EEG

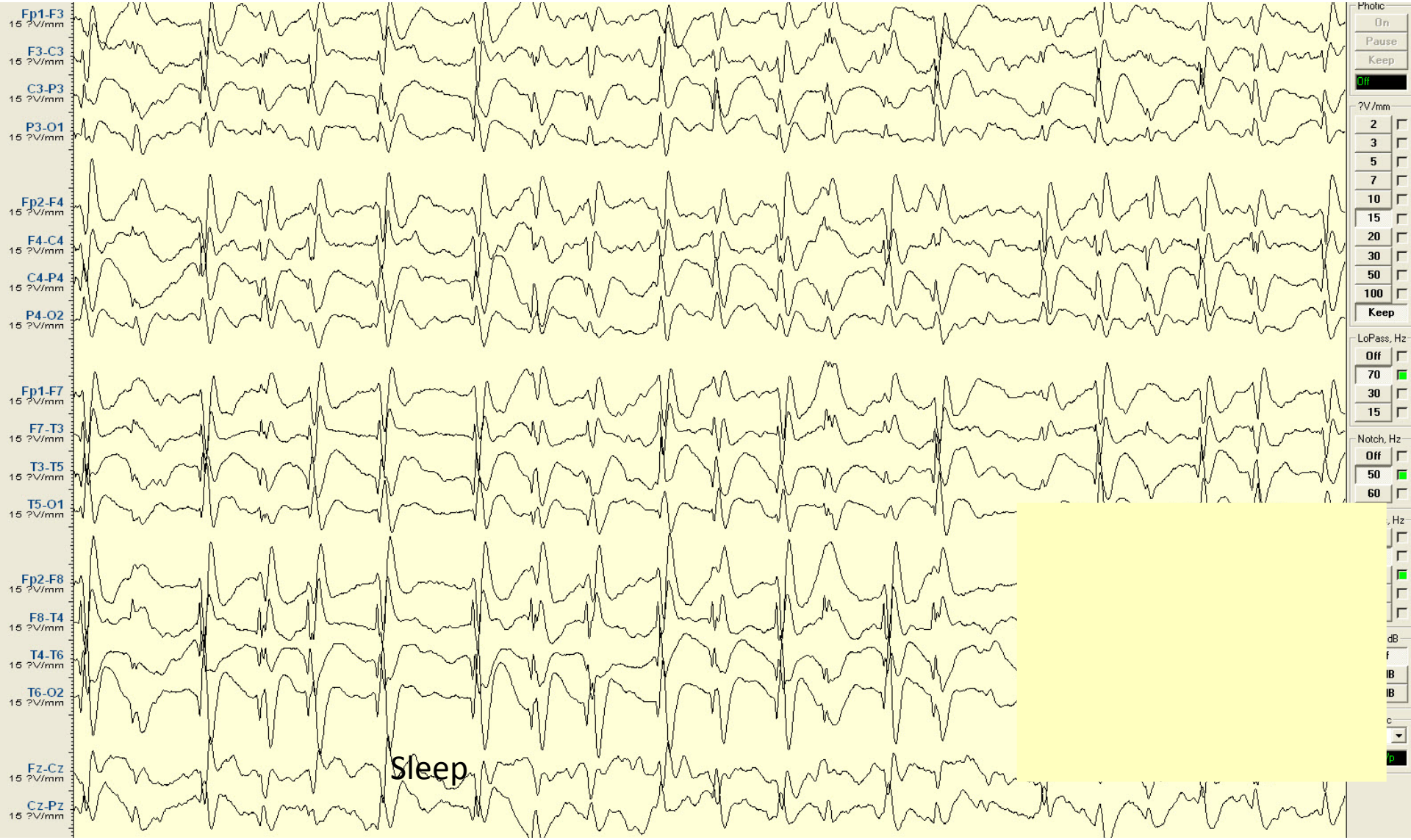

Fp1-F3
15 ?V/mm
F3-C3
15 ?V/mm
C3-P3
15 ?V/mm
P3-O1
15 ?V/mm
Fp2-F4
15 ?V/mm
F4-C4
15 ?V/mm
C4-P4
15 ?V/mm
P4-O2
15 ?V/mm
Fp1-F7
15 ?V/mm
F7-T3
15 ?V/mm
T3-T5
15 ?V/mm
T5-O1
15 ?V/mm
Fp2-F8
15 ?V/mm
F8-T4
15 ?V/mm
T4-T6
15 ?V/mm
T6-O2
15 ?V/mm
Fz-Cz
15 ?V/mm
Cz-Pz
15 ?V/mm
On
Pause
Keep
Off
?V/mm
2
3
5
7
10
15
20
30
50
100
Keep
LoPass, Hz
Off
70
30
15
Notch, Hz
Off
50
60
HiPass, Hz
Off
0.5
1
3
10
Noise, dB
Off
-3 dB
-6 dB
mm/sec
30
10 sec/p

Drowsy EEG



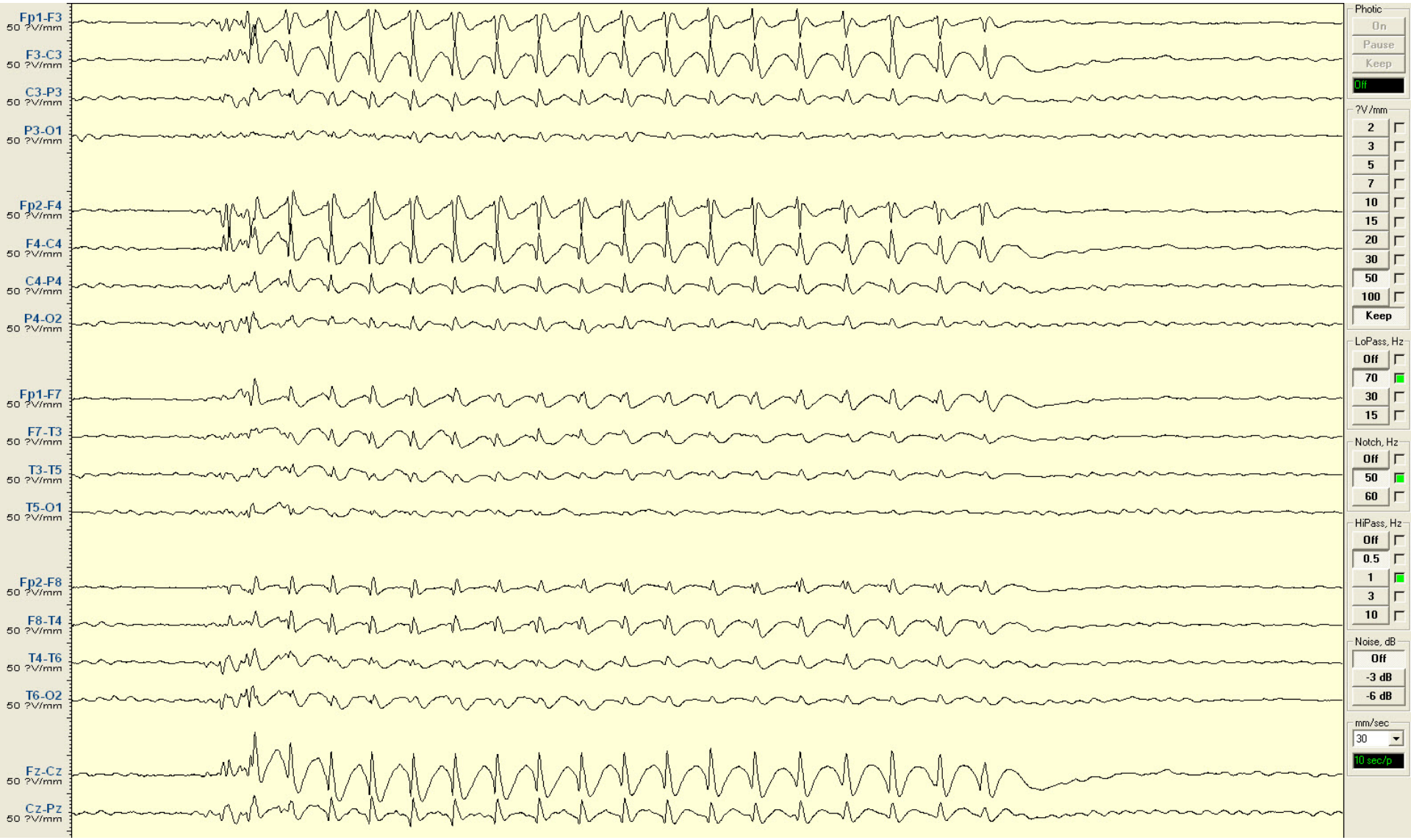
Early sleep

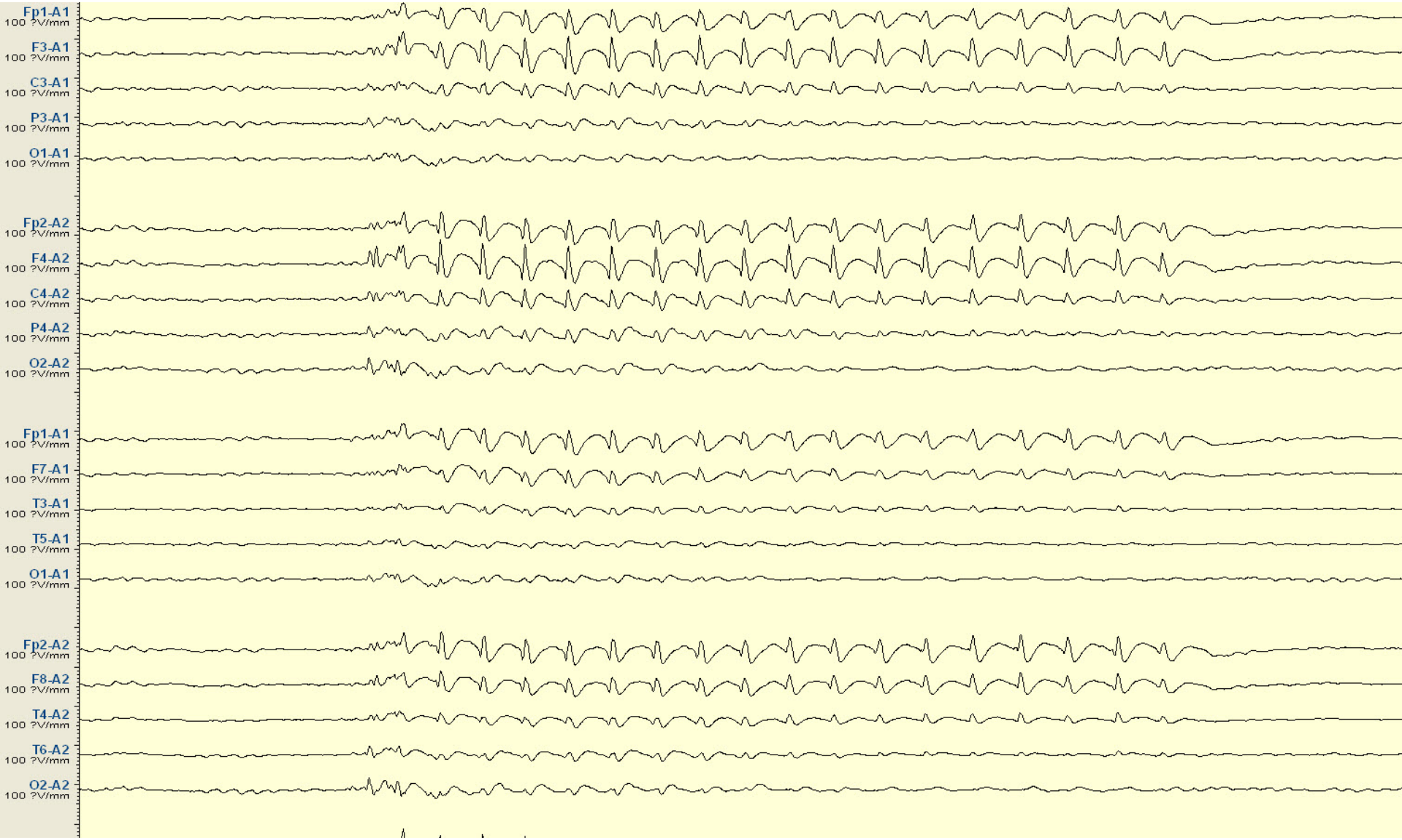
Asleep EEG


Fp1-F3
15 ?V/mm
F3-C3
15 ?V/mm
C3-P3
15 ?V/mm
P3-O1
15 ?V/mm
Fp2-F4
15 ?V/mm
F4-C4
15 ?V/mm
C4-P4
15 ?V/mm
P4-O2
15 ?V/mm
Fp1-F7
15 ?V/mm
F7-T3
15 ?V/mm
T3-T5
15 ?V/mm
T5-O1
15 ?V/mm
Fp2-F8
15 ?V/mm
F8-T4
15 ?V/mm
T4-T6
15 ?V/mm
T6-O2
15 ?V/mm
Fz-Cz
15 ?V/mm
Cz-Pz
15 ?V/mm
Sleep
Photic
On
Pause
Keep
Off
?V/mm
2
3
5
7
10
15
20
30
50
100
Keep
LoPass, Hz
Off
70
30
15
Notch, Hz
Off
50
60

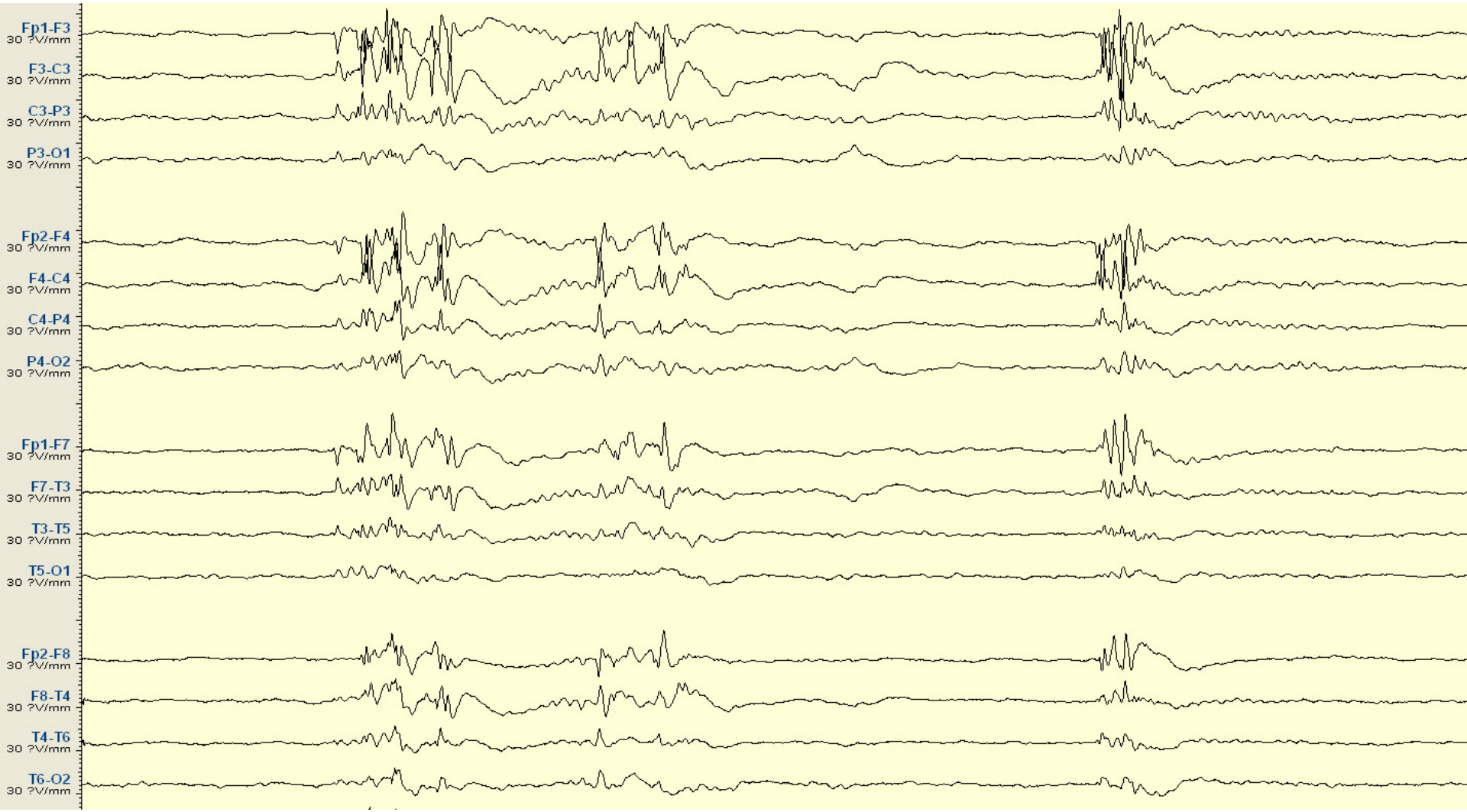
Juvenile absence epilepsy (JAE)

- Onset : Peak 10-12 years
- Seizure type : Absence (less frequent and severity to childhood absence)JAE beautfifl.avi
  : GTC
- Interictal EEG :
- Ictal EEG :
- Causes :
- Course : generally good
- Treatment : VPA, LTG, LEV


Fp1-F3
50 ?V/mm
F3-C3
50 ?V/mm
C3-P3
50 ?V/mm
P3-O1
50 ?V/mm
Fp2-F4
50 ?V/mm
F4-C4
50 ?V/mm
C4-P4
50 ?V/mm
P4-O2
50 ?V/mm
Fp1-F7
50 ?V/mm
F7-T3
50 ?V/mm
T3-T5
50 ?V/mm
T5-O1
50 ?V/mm
Fp2-F8
50 ?V/mm
F8-T4
50 ?V/mm
T4-T6
50 ?V/mm
T6-O2
50 ?V/mm
Fz-Cz
50 ?V/mm
Cz-Pz
50 ?V/mm
Photic
On
Pause
Keep
Off
?V/mm
2
3
5
7
10
15
20
30
50
100
Keep
LoPass, Hz
Off
70
30
15
Notch, Hz
Off
50
60
HiPass, Hz
Off
0.5
1
3
10
Noise, dB
Off
-3 dB
-6 dB
mm/sec
30
10 sec/p


Fp1-A1
100 ?V/mm
F3-A1
100 ?V/mm
C3-A1
100 ?V/mm
P3-A1
100 ?V/mm
O1-A1
100 ?V/mm
Fp2-A2
100 ?V/mm
F4-A2
100 ?V/mm
C4-A2
100 ?V/mm
P4-A2
100 ?V/mm
O2-A2
100 ?V/mm
Fp1-A1
100 ?V/mm
F7-A1
100 ?V/mm
T3-A1
100 ?V/mm
T5-A1
100 ?V/mm
O1-A1
100 ?V/mm
Fp2-A2
100 ?V/mm
F8-A2
100 ?V/mm
T4-A2
100 ?V/mm
T6-A2
100 ?V/mm
O2-A2
100 ?V/mm

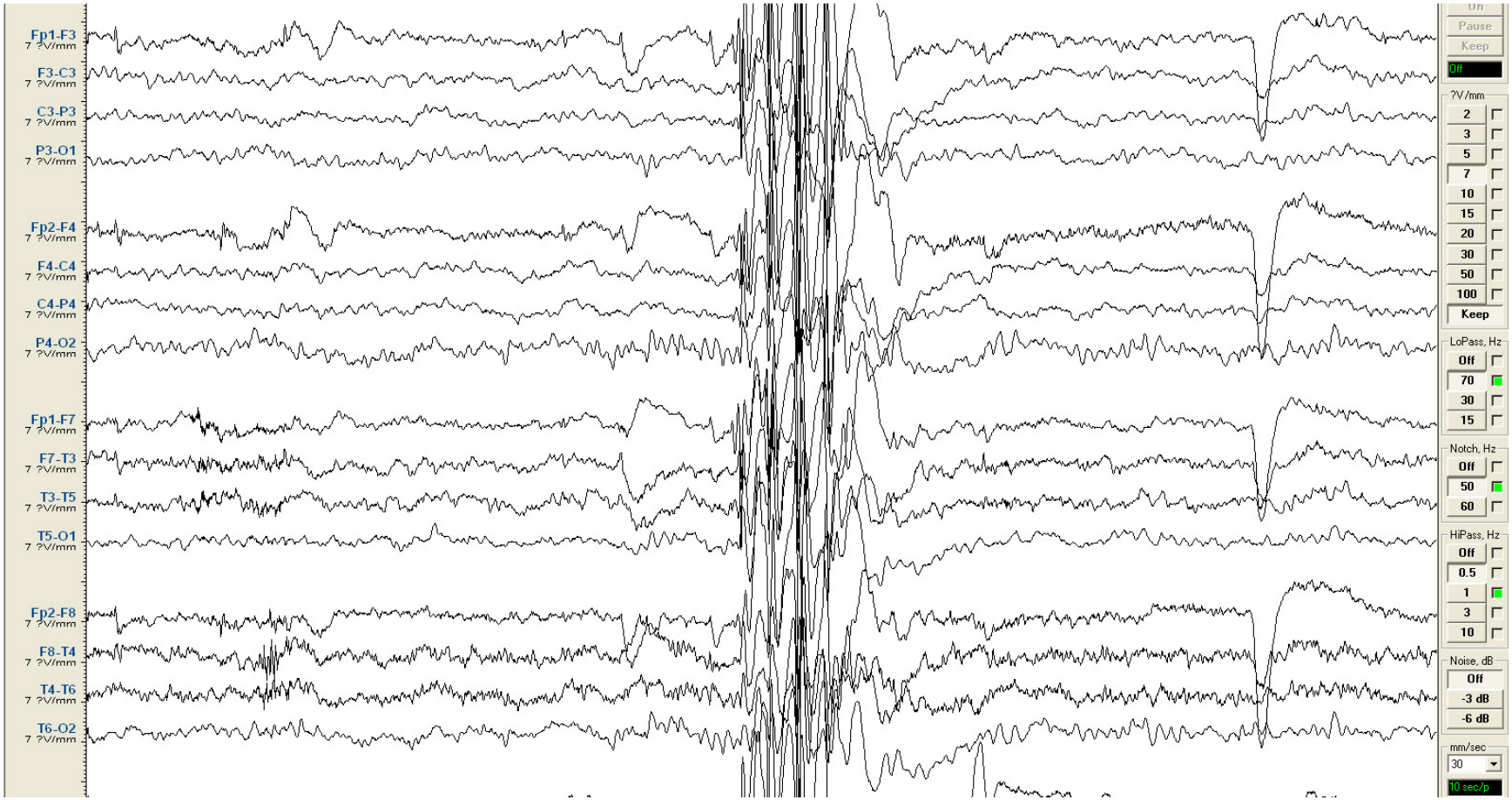
Fragmented during sleep



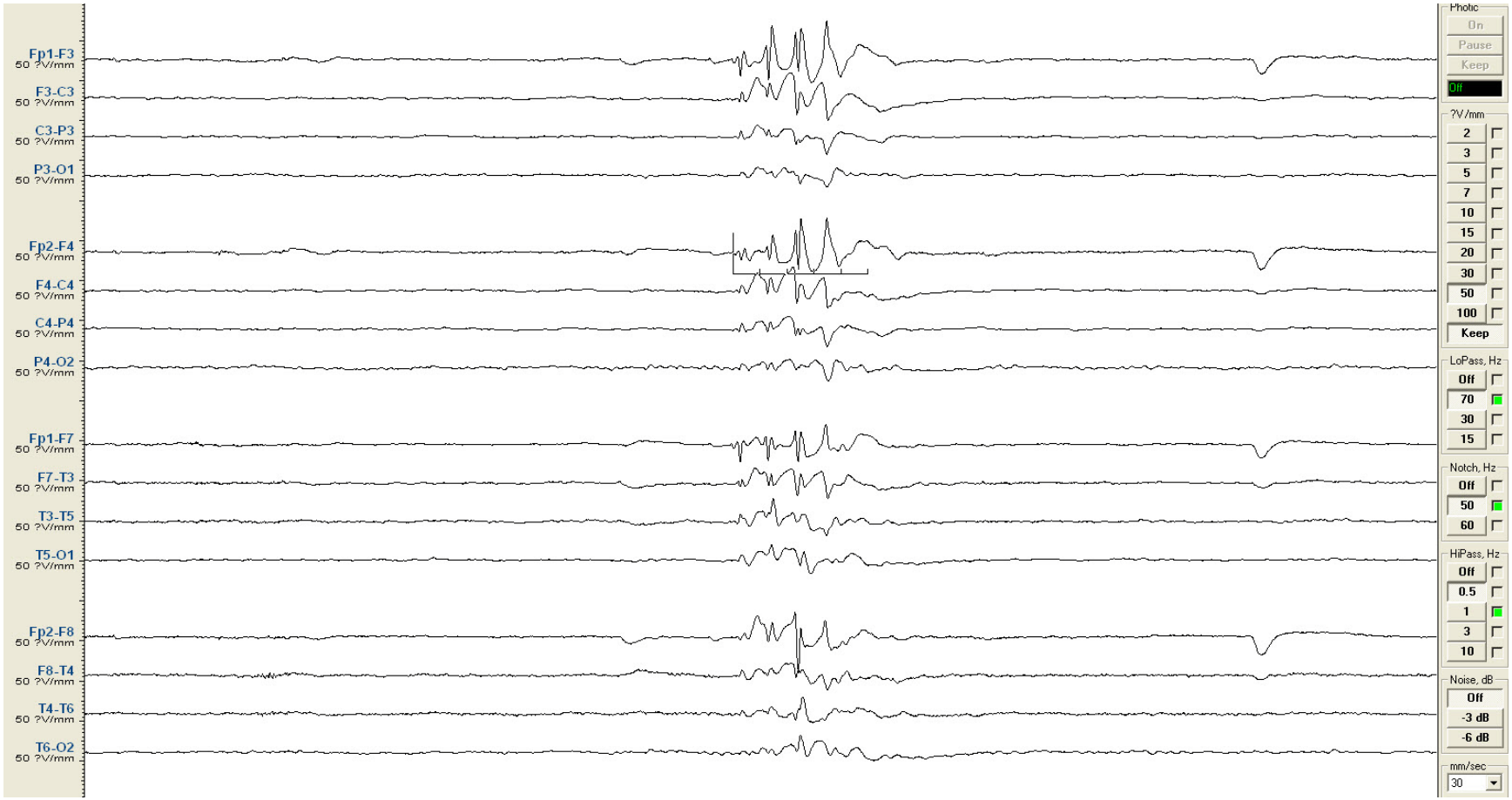
Juvenile myoclonic epilepsy (JME)

- Onset : 12-18 years
- Seizure type : Myoclonic (am, upper limbs)
  : GTC (80-90%)
  : Absence
- Interictal EEG : Polyspike-wave (4-6 Hz)
- Ictal EEG :
- Causes : Genetics?
- Course : Life-long treatment
- Treatment : VPA, TPM, LEV, LTG

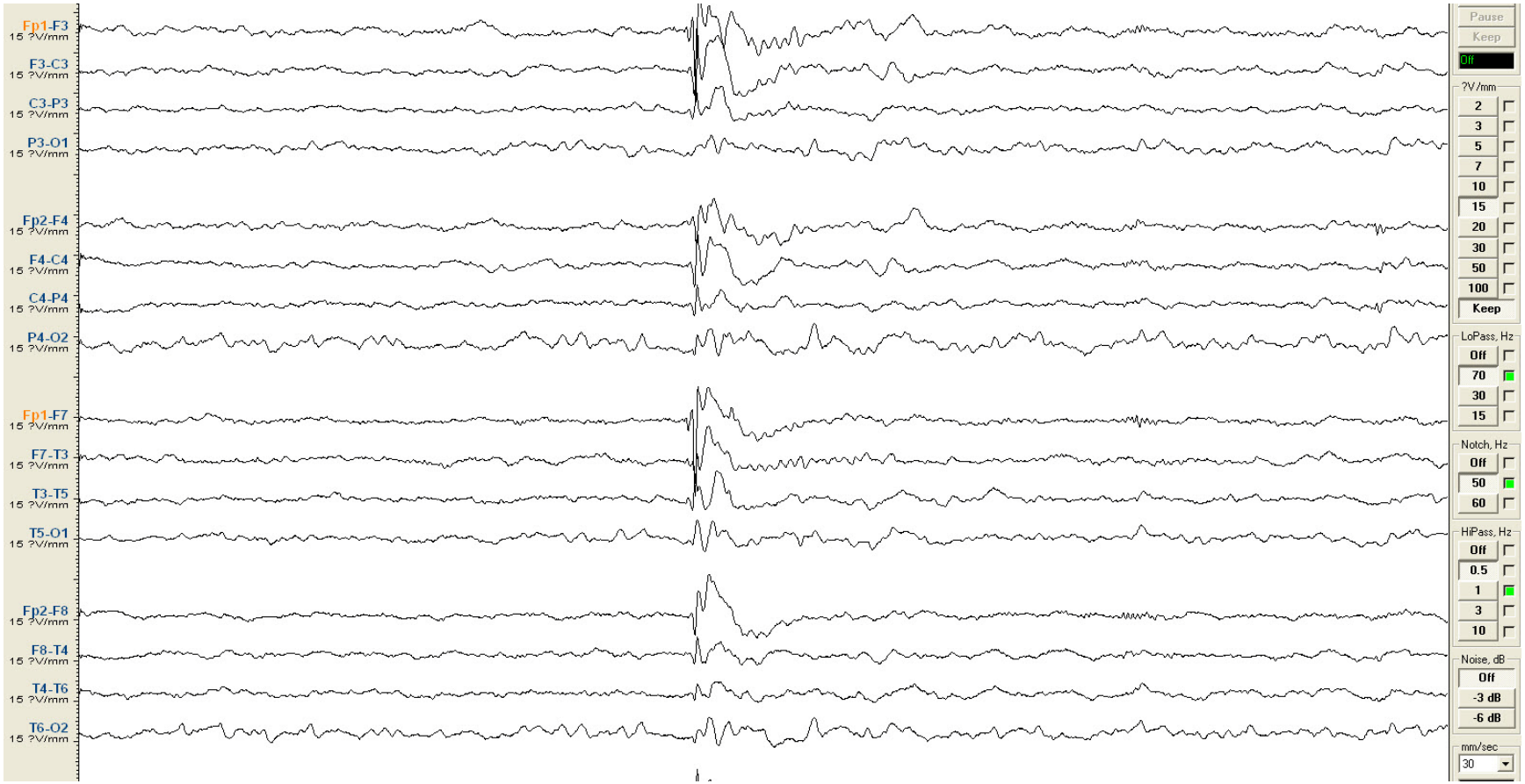
Fast spike-wave at 7 microvolt/cm



Same EEG at 50 microvolts/cm



Fragmented PSW without clinical



Practical points

- EEG during awake and asleep in each epileptic syndrome may have different characteristics
  - BCECT: may be only abnormal during sleep
  - IS: hypsarrhythmia (awake), burst-suppress (sleep)
- Both awake and asleep EEG, as well as certain activation methods should be done in individual patients with different syndrome
  - Absence: hyperventilation
  - JME: sleep deprivation and awaken during EEG

Practical point

- Physicians who order the EEG should give adequate information regarding the clinical seizures and other information in order to increase the yield of diagnosis
  - Absence : should stress on hyperventilation
  - BRE : should include sleep portion
  - BEOP : should include eye open, eye closing
  - JME : should include EEG after awakening
  - LKS, ESES : definitely should include slow wave sleep portion

Summary

- EEG is an important role in epileptic syndrome diagnosis
- However, accurate EEG interpretation must have important clues from clinical history provided by attending physicians
- EEGers need information provided by attending physicians and vice versa

Summary

- Accurate epileptic syndrome diagnosis leads to appropriate management of each patients as well as counseling.