

EEG phase synchrony

:

1,2, 1,2, 3, 4, 1, 1*
1
2
3
4

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A Comparison between Executed and Imagined Movements in Phase Synchrony of EEG in humans with Stroke: A Preliminary Study

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5 (Affected hand /)
가 가 가 ,
가 Active movement 가 Passive movement,
가 Motor Imagery(MI) 가 task
EEG Phase locking
value(PLV) task
Passive movement 가 Active movement 가
motor task 375ms 가 ,
687.5ms Active movement MI 가
motor task EEG 가

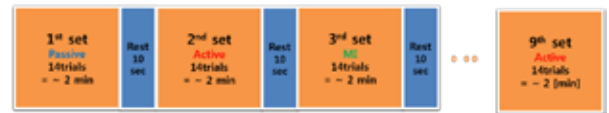
Keywords : phase synchrony, PLV, Motor intention, Movement, EEG, Stroke

1. ERD/ERS motor test score FMA 가
가 [5, 6].
, motor cortex
[1, 2].
가 , fMRI synchro
가 ny , fMRI 가 가
가 BCI 가 가
가 [3, 4]. [7].
Kai Keng Ang et al.(2010) 가 EE
affected hand MI(motor imagery) G 가
FMA(Fugl-Meyer Motor Funct ion Assessment)
, Kaiser et al.(2012) EEG
affected hand ME(motor execution) MI task

locking value(PLV) [8-10]. (phase)
 Wang et al.(2006) Motor imagery synchrony
 Zhou et al.,(2010) motor imagery synchrony phase synchrony

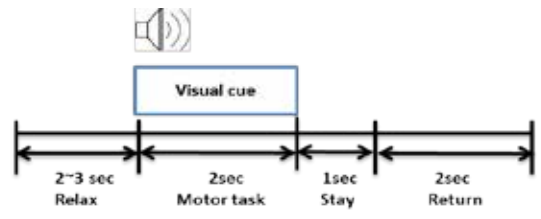
motor task phase synchrony
 Active movement phase synchrony
 Passive movement phase synchrony
 Motor Imagery(MI) task
 Active movement task
 Passive movement task

55.6, 70, 3, 5, 3, 2, 40 pacemaker
 EEG



affected hand
 haptic device [12-14]

motor task trial 3
 2~3 가
 motor task Active movement/Passive movement/MI task
 'Return'



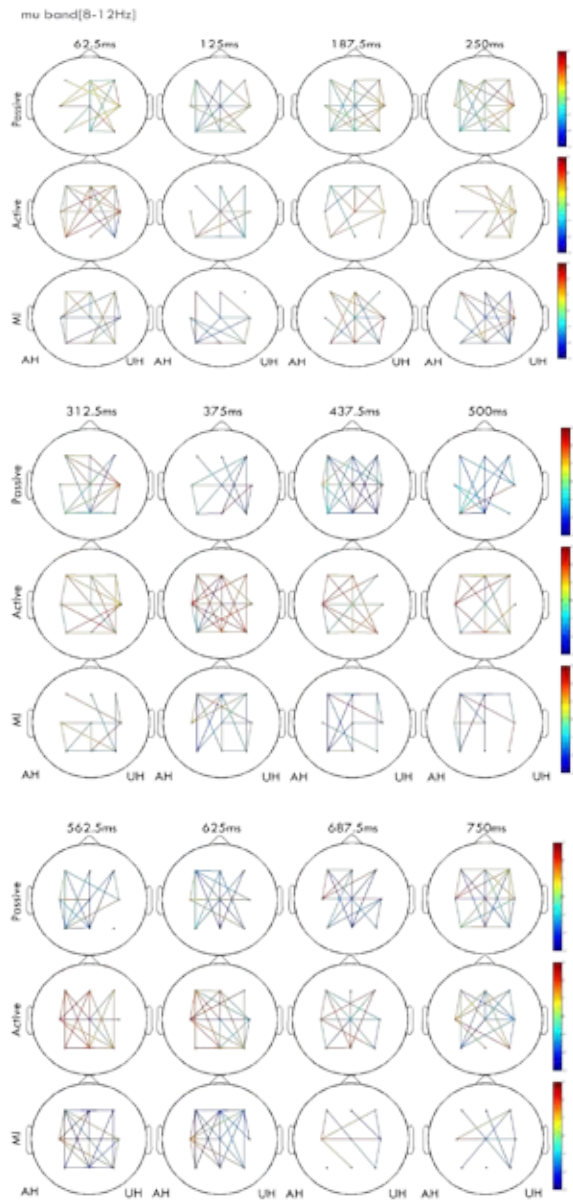
3) Motor task
 DSP processor haptic device flash haptic device

4) EEG 2048Hz resampling 60Hz notch filtering
 EEG 1024Hz band pass filtering
 Independent Component Analysis(ICA) Electrooculography(EOG) Electromyography(EMG)

가
 Common Average Reference(CAR)
 motor cortex C3 C4 EEG front
 al lobe parietal lobe
 F3, Fz F4, C3, Cz, C4, P3, Pz, P4 9
 (8-12Hz) EEG
 Hilbert transform PLV
 [15]. motor task
 -1~0 base line
 time window 62.5ms
 t-test(, 0.001)
 가

3.
 Active movement task
 Passive movement task,
 Motor Imagery task
 mu band[8-12Hz] motor task
 EEG
 가 (p<0.001),
 가
 Active movement Passive movement t
 ask EEG
 4 motor task 750m
 s time window 62.5ms
 Active movement Passive mo
 vement task EEG mot
 or task 가 task 가
 , 312.5ms Passive movement task
 EEG Active mo
 vement task 가
 motor task
 750ms task EEG
 Passive
 movement task AH(affected hand) UH(unaffected
 hand) EEG
 , Active movement task
 375~687,5ms AH EEG

trial , Active movement 375ms
 Co 가 MI task 250~312.5ms
 가 가
 687.5ms Active mo
 vement MI task EEG 가
 motor task
 MI task 가 Active movement t
 ask



(4) mu band[8-12Hz] motor task EEG

Active movement MI task EEG
 Passive movement Active movement 가
 MI task EEG
 Active movement task 가 motor task

4.
 motor task

가 .
 motor task 가
 ase synchrony motor cortex ph
 movement Passive movement task Active
 Tombari et al.(2004)
 movement task Active movement/Passive move
 가 fMRI
 [16].
 motor cortex baseline
 time window Active movement Pas
 sive movement task EEG
 t-test (p<0.01), mu band
 task 가 가 .
 가 . Chung et al.(2012)
 EEG study MI sensorimotor rhythms
 frontal and central sensorimotor
 alpha phase synchronization 가
 , Active movement MI tas
 k 가
 [17].
 motor cortex
 phase synchrony
 mu band task /
 가 , motor t
 ask 687.5ms MI task
 가 Active movement task

5.
 5
 가 motor task
 , motor task
 가
 EEG phase synchrony 가

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