

Figure 1 Non-fatigue brain connectivity map of subject No. 1 (a) in non-fatigue state 0~20 minutes (b) in fatigue state 41~60 minutes

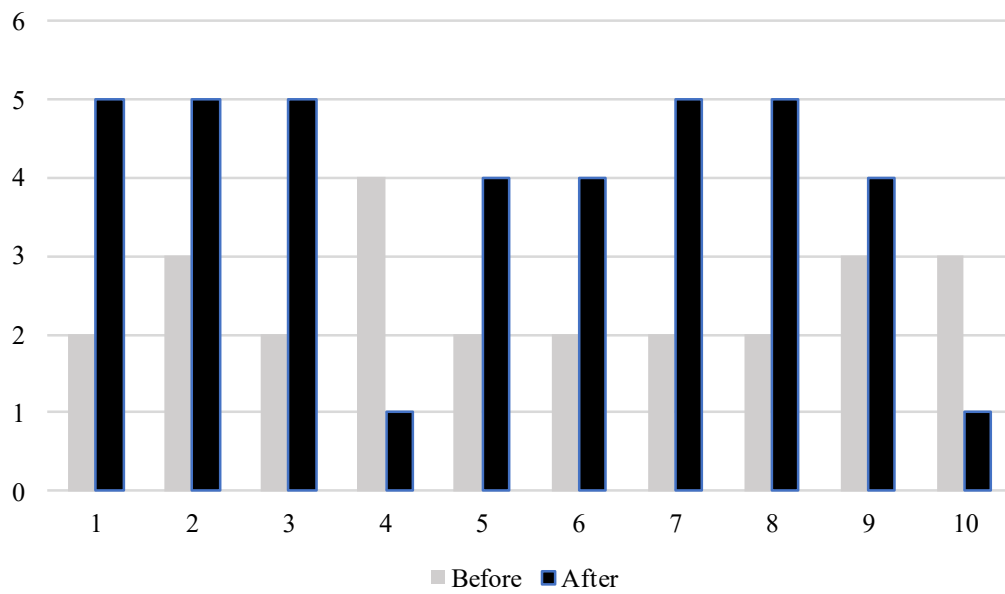


Figure 2 FAS questionnaire results for subject No. 1

Table 1 Top 10 ranking of wPLI for subject No. 1

| | 1 | 2 | 3 | 4 | 5 | 6 |
|----|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | "FP1-FT8" | "T7-TP7" | "P3-Pz" | "P3-Pz" | "FP1-P7" | "F4-C4" |
| 2 | "AF3-CP3" | "T8-Oz" | "FP2-F8" | "T7-TP7" | "FP1-P3" | "FP1-P3" |
| 3 | "Pz-T8" | "FP2-Oz" | "CPz-P3" | "F8-O1" | "FP1-F4" | "F4-FC4" |
| 4 | "FP1-T8" | "P3-Pz" | "C4-P4" | "F4-F8" | "F4-TP7" | "F4-FCz" |
| 5 | "FC3-Pz" | "F8-FCz" | "F4-FC4" | "CPz-P3" | "AF3-F3" | "AF3-P3" |
| 6 | "AF3-C3" | "FT8-O1" | "T7-TP7" | "F8-Oz" | "F3-T8" | "F7-F4" |
| 7 | "P4-T8" | "FT7-T7" | "P3-P4" | "P3-P4" | "AF3-F4" | "FP1-F4" |
| 8 | "FP1-F8" | "F3-Oz" | "CP4-P3" | "FC4-FT8" | "FP1-CP3" | "FP1-AF4" |
| 9 | "P3-Pz" | "TP8-Oz" | "F4-Oz" | "Cz-TP7" | "F4-P3" | "C4-P3" |
| 10 | "CP3-Pz" | "F7-Oz" | "AF3-P3" | "F4-FT8" | "FP2-P3" | "Cz-T8" |
| | 7 | 8 | 9 | 10 | 11 | 12 |
| 1 | "CPz-O1" | "F4-CPz" | "FP1-F4" | "Pz-O2" | "F8-C4" | "F3-T8" |
| 2 | "P4-O1" | "C4-Oz" | "F4-FT8" | "CPz-O2" | "FP2-FT8" | "CP4-TP8" |
| 3 | "F8-FCz" | "FP1-P7" | "TP7-P7" | "F4-CPz" | "FP2-F8" | "AF3-T8" |
| 4 | "Pz-O1" | "FP1-Oz" | "P3-Pz" | "F4-FT8" | "FP1-CPz" | "FP1-F8" |
| 5 | "P7-O1" | "C4-P7" | "FP2-F4" | "Cz-O2" | "F8-CPz" | "FP1-CP3" |
| 6 | "Fz-FC4" | "C4-TP7" | "FP1-P3" | "C3-O2" | "TP8-P3" | "CP4-T8" |
| 7 | "C4-O1" | "C4-P3" | "AF3-F4" | "FP1-O2" | "AF3-F8" | "FP2-TP8" |
| 8 | "F8-C3" | "FC4-TP8" | "F4-CPz" | "CP3-O2" | "FP2-CPz" | "AF4-TP8" |
| 9 | "C4-O2" | "FP1-AF3" | "F4-T8" | "C4-O2" | "AF3-F4" | "TP8-Pz" |
| 10 | "Oz-O2" | "F4-C3" | "FP1-F8" | "CPz-P3" | "FP1-P3" | "TP8-P3" |
| | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 | "F7-CPz" | "F4-FT8" | "FP1-FP2" | "Fz-O1" | "FP1-FP2" | "AF4-F8" |
| 2 | "C3-CPz" | "CP4-P4" | "F4-FT8" | "FP1-Cz" | "FP1-P3" | "FP1-FT8" |
| 3 | "F4-CPz" | "FP2-F3" | "T7-C4" | "FC3-O1" | "FP1-CP3" | "F7-T7" |
| 4 | "Fz-F4" | "CP3-CPz" | "F8-P7" | "Cz-O1" | "C4-CP3" | "Fz-F4" |
| 5 | "F4-FT8" | "Fz-FT8" | "C3-CPz" | "FP2-AF3" | "FP1-Cz" | "Fz-FT8" |
| 6 | "FP1-F8" | "FC4-FT8" | "FP1-P3" | "F3-Fz" | "FP1-F4" | "F4-FT8" |
| 7 | "FCz-CPz" | "Cz-CPz" | "FP1-P7" | "FP1-Fz" | "C4-P3" | "AF3-F4" |
| 8 | "T7-C4" | "F8-O2" | "F7-P4" | "F8-O1" | "FP1-FC3" | "F7-FC4" |
| 9 | "F4-C3" | "C3-CPz" | "F4-CPz" | "P7-T8" | "F8-TP8" | "AF3-FCz" |

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| 10 | "FC4-FT8" | "AF3-FT8" | "F8-O1" | "AF3-F3" | "FC3-C4" | "F7-C4" |
| | 19 | 20 | 21 | 22 | 23 | 24 |
| 1 | "F4-FT8" | "AF4-O1" | "FP1-FT8" | "F4-FC3" | "F7-FC3" | "TP7-O1" |
| 2 | "FP1-FT8" | "FP2-CP4" | "FP1-F8" | "P7-O2" | "F3-F4" | "FCz-O2" |
| 3 | "F4-F8" | "T8-O1" | "FP1-FC3" | "TP8-O2" | "FP2-Fz" | "T8-O1" |
| 4 | "FP2-T7" | "F7-Pz" | "P7-Pz" | "AF4-F8" | "O1-O2" | "C4-O2" |
| 5 | "FC4-O1" | "Fz-F4" | "FP2-FT8" | "F4-FCz" | "FP2-FC3" | "Fz-O1" |
| 6 | "AF4-F3" | "FP2-Cz" | "FP2-F8" | "FT8-T8" | "FP1-FC3" | "F7-O2" |
| 7 | "F4-O2" | "FP2-P4" | "FP2-FC3" | "Oz-O2" | "F3-FC3" | "T7-O1" |
| 8 | "Fz-O1" | "F4-F8" | "CP4-P4" | "FP1-F8" | "FP2-FCz" | "P3-O1" |
| 9 | "F7-FC3" | "F7-TP8" | "FT8-C4" | "Fz-F4" | "AF3-F7" | "F3-O2" |
| 10 | "F7-T7" | "FT7-C4" | "FP1-C4" | "AF4-O1" | "F4-O2" | "FC3-O1" |
| | 25 | 26 | 27 | 28 | 29 | 30 |
| 1 | "AF4-F8" | "FP2-FT8" | "P3-Pz" | "Pz-T8" | "FP2-F8" | "T7-O2" |
| 2 | "FP2-Pz" | "FP2-FC3" | "Fz-Oz" | "TP7-P7" | "AF4-F8" | "F4-T8" |
| 3 | "FP1-T8" | "FP2-Cz" | "Fz-C4" | "F4-O1" | "F8-Oz" | "F4-TP7" |
| 4 | "F7-TP8" | "FP2-CP3" | "FC4-P7" | "C3-CPz" | "FC3-T8" | "F4-C4" |
| 5 | "F3-TP8" | "P7-O1" | "AF3-FT8" | "FC3-FT8" | "CP4-Oz" | "F4-CP3" |
| 6 | "F7-Fz" | "C3-P7" | "C3-CPz" | "F4-O2" | "Pz-O2" | "F7-P4" |
| 7 | "AF4-T8" | "FP2-CPz" | "F3-CP3" | "FC3-Oz" | "P4-Oz" | "AF4-P3" |
| 8 | "AF4-P7" | "AF4-P3" | "P3-P4" | "F8-O1" | "Cz-Oz" | "F4-TP8" |
| 9 | "F7-P4" | "FP2-AF3" | "FC4-C3" | "FT7-Pz" | "FT7-Oz" | "C3-CPz" |
| 10 | "F7-CP3" | "P7-O2" | "C4-P3" | "F7-C4" | "F8-P7" | "C3-CP3" |
| | 31 | 32 | 33 | 34 | 35 | 36 |
| 1 | "FP2-FC3" | "FC3-Oz" | "FT8-C3" | "FP2-FCz" | "C4-Pz" | "AF4-FC4" |
| 2 | "FP2-CP3" | "FT8-T8" | "FC4-FT8" | "FP2-Cz" | "F7-O1" | "F7-Oz" |
| 3 | "C4-CP3" | "AF3-FC3" | "FP2-AF3" | "F3-C4" | "C4-P3" | "Cz-Oz" |
| 4 | "FP2-AF3" | "FC3-FT8" | "AF4-Cz" | "P7-Pz" | "FCz-TP8" | "AF4-Oz" |
| 5 | "AF3-F3" | "Fz-F4" | "FT7-FT8" | "F4-T8" | "AF3-F3" | "FT7-Oz" |
| 6 | "FP2-FT7" | "FC3-T8" | "Fz-T8" | "AF4-O1" | "FP2-FC3" | "FC4-T8" |
| 7 | "C4-P3" | "FT8-P3" | "Fz-TP8" | "F7-Oz" | "F7-CPz" | "T7-Oz" |
| 8 | "FP2-F3" | "CP3-Oz" | "FP2-Fz" | "FP2-AF3" | "C4-TP8" | "FCz-Oz" |

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| 9 | "F3-Oz" | "Cz-Oz" | "FT8-T7" | "FT8-CPz" | "AF4-F8" | "C3-O2" |
| 10 | "FP2-Cz" | "CP4-P4" | "FT8-Cz" | "F7-O2" | "CPz-P3" | "FC3-Oz" |
| | 37 | 38 | 39 | 40 | 41 | 42 |
| 1 | "FP1-F4" | "F4-FT7" | "F7-TP8" | "FCz-FC4" | "O1-O2" | "T8-Oz" |
| 2 | "FP2-AF4" | "FP2-Oz" | "F7-T8" | "FP2-F4" | "AF4-C3" | "O1-O2" |
| 3 | "AF4-F4" | "F4-F8" | "F7-P3" | "FP1-F4" | "AF4-F3" | "CPz-T8" |
| 4 | "FT8-Pz" | "F4-T7" | "F4-P3" | "C3-C4" | "AF4-FC3" | "T8-O1" |
| 5 | "F7-O2" | "AF3-F4" | "FP2-CP3" | "C4-Oz" | "AF4-P3" | "Pz-O2" |
| 6 | "F7-Cz" | "F4-P3" | "F4-FT7" | "FC4-Cz" | "T7-C4" | "FT7-C4" |
| 7 | "FP1-Pz" | "F4-TP7" | "FT7-C4" | "F4-O2" | "F7-Oz" | "FC3-Pz" |
| 8 | "F3-Oz" | "F4-Cz" | "F7-FC3" | "FC4-T8" | "AF4-FT7" | "FT8-C4" |
| 9 | "F7-C4" | "F4-CPz" | "FP2-FC3" | "FC4-P3" | "AF4-Cz" | "FP2-TP7" |
| 10 | "FP2-Oz" | "F4-CP4" | "P7-T8" | "FC4-C3" | "AF4-CP3" | "Cz-T8" |
| | 43 | 44 | 45 | 46 | 47 | 48 |
| 1 | "T8-Oz" | "AF4-F8" | "F7-FT8" | "AF3-F3" | "FP1-AF3" | "FT8-O2" |
| 2 | "F7-O2" | "AF4-P7" | "FP1-Oz" | "F4-FC4" | "FP1-P3" | "F4-TP7" |
| 3 | "FT8-T8" | "Pz-O2" | "F4-T8" | "FT8-P7" | "T8-Oz" | "C4-Oz" |
| 4 | "FC3-T8" | "AF4-FCz" | "FP2-F4" | "TP7-P7" | "FP1-F7" | "F4-F8" |
| 5 | "F7-FT8" | "P7-Oz" | "F7-P7" | "FC4-Pz" | "FP1-TP7" | "F8-O2" |
| 6 | "F3-F4" | "F4-FT8" | "F4-TP8" | "Fz-FC4" | "FP1-F4" | "AF3-F4" |
| 7 | "TP8-Oz" | "AF3-Oz" | "FT7-Oz" | "F3-Fz" | "FP1-FT7" | "F4-P3" |
| 8 | "T8-T8" | "AF4-Cz" | "FP1-T8" | "FP1-F4" | "FP1-FCz" | "C3-Oz" |
| 9 | "FC3-TP8" | "C3-Oz" | "F7-C3" | "F3-O1" | "C4-TP8" | "TP7-O1" |
| 10 | "F7-F4" | "F7-FC3" | "FT8-T8" | "T7-T8" | "FP1-FC3" | "F4-FT8" |
| | 49 | 50 | 51 | 52 | 53 | 54 |
| 1 | "FP1-CP3" | "F8-FT7" | "TP8-Pz" | "F4-T7" | "FT8-Oz" | "FP2-Pz" |
| 2 | "F4-F8" | "FP1-FP2" | "Oz-O2" | "F4-Cz" | "Pz-O1" | "FP1-Pz" |
| 3 | "FP1-P3" | "F4-FT8" | "AF3-Oz" | "FC3-Oz" | "F3-FT8" | "FP1-P4" |
| 4 | "FP1-CPz" | "TP7-P7" | "FC4-CP4" | "F4-FCz" | "FCz-FT8" | "FP2-P4" |
| 5 | "FP1-FCz" | "P7-O2" | "FC4-T8" | "F4-C3" | "FC3-FT8" | "TP7-O1" |
| 6 | "T7-C3" | "FP1-F8" | "AF4-F8" | "F4-FC3" | "FT8-TP7" | "FP1-CP4" |
| 7 | "FP1-AF3" | "C3-Oz" | "FC4-P4" | "FCz-C4" | "AF4-C4" | "FP1-TP8" |

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| 8 | "FP1-T7" | "AF3-FT7" | "FT8-O1" | "T7-Oz" | "FT8-CP4" | "FC4-FT8" |
| 9 | "FP1-F3" | "AF3-FT8" | "F4-T7" | "FT8-CPz" | "F7-Pz" | "FP1-O1" |
| 10 | "FP1-CP4" | "FP2-F8" | "F4-Oz" | "FT8-P3" | "F4-C4" | "FP2-CP4" |
| | 55 | 56 | 57 | 58 | 59 | 60 |
| 1 | "CP3-Pz" | "F4-F8" | "F8-P3" | "FC3-Pz" | "FC3-Oz" | "F8-T8" |
| 2 | "FT8-CP3" | "T8-T8" | "C3-T8" | "Pz-O1" | "T7-TP7" | "FC3-T8" |
| 3 | "F4-C4" | "F4-C4" | "AF4-F4" | "Pz-P4" | "FCz-TP7" | "Pz-P4" |
| 4 | "FT8-CP4" | "CP4-P4" | "P3-Pz" | "F3-Pz" | "Fz-TP7" | "FT8-C4" |
| 5 | "T7-TP7" | "F4-O2" | "F7-Pz" | "F8-FT8" | "FT7-TP7" | "F8-CP4" |
| 6 | "CP3-P3" | "FC3-T8" | "FP2-AF4" | "Cz-Pz" | "Cz-TP7" | "AF3-T8" |
| 7 | "TP7-TP8" | "FT7-T8" | "FT8-TP8" | "F8-C4" | "FC3-TP8" | "F8-FT7" |
| 8 | "CP3-CPz" | "T8-P7" | "F7-F3" | "Pz-Oz" | "C3-TP7" | "FC3-O2" |
| 9 | "C3-CP3" | "FP1-FP2" | "FP2-FT8" | "CPz-Pz" | "TP7-CP3" | "TP7-Oz" |
| 10 | "FT8-P3" | "F4-O1" | "F7-P4" | "AF3-Pz" | "T7-C3" | "F4-F8" |