**Supplementary Material**

Table S1: The mean and std of the center of the mass for each category in x,y,z coordinates.

| Coordinates | Mean(std) FEP | Mean(std) CHR | Mean(std) HC |
|-------------|--------------|--------------|--------------|
| x           | 60.6710(0.1161) | 60.6265 (0.1462) | 60.6494 (0.1188) |
| y           | 70.1180 (0.5501) | 69.9588 (0.5433) | 70.1552 (0.6126) |
| z           | 53.7673 (0.5483) | 53.7328 (0.5500) | 53.8205 (0.4254) |

Table S2: The mean values of the lambda in brain regions were calculated using the aal.nii template in the MRIcron.

| Regions                  | HC    | FEP   | CHR   | Regions                  | HC    | FEP   | CHR   |
|--------------------------|-------|-------|-------|--------------------------|-------|-------|-------|
| Precentral_L 2001        | 0.0030| 0.0002| 0.0006| Insula_R 3002            | 0.0049| -     | -     |
| Precentral_R 2002        | 0.0029| 0.0001| 0.001  | Cingulum_Ant_L 4001      | 0.0057| -     | -     |
| Frontal_Sup_L 2101       | 0.0047| 0.0001| 6.5E-05| Cingulum_Ant_R 4002      | 0.0064| -     | -     |
| Frontal_Sup_R 2102       | 0.0043| 0.0001| -     | Cingulum_Mid_L 4011      | 0.0065| -     | 0.0009|
| Frontal_Sup_Orb_L 2111   | 0.0035| 3.25E-05| -     | Cingulum_Mid_R 4012      | 0.0063| -     | 0.0006|
| Frontal_Sup_Orb_R 2112   | 0.0034| -     | -     | Cingulum_Post_L 4021     | 0.0123| -     | 0.0020|
| Frontal_Mid_L 2201       | 0.0064| 0.0006| 48    | Cingulum_Post_R 4022     | 0.0131| -     | 0.0009|
| Frontal_Mid_R 2202       | 0.0057| -     | -     | Hippocampus_L 4101       | 0.0127| 0.0001| 0.0002|
| Frontal_Mid_Orb_L 2211   | 0.0026| 0.0001| 3.13E-05| Hippocampus_R 4102     | 0.0114| 2.48E-05| 3.32E-05|
| Frontal_Mid_Orb_R 2212   | 0.0013| 0.0006| 48    | ParaHippocampa_L 4111    | 0.0103| 0.0004| 0.0010|
| Frontal_Inf_Oper_L 2301  | 0.0040| 0.0019| 0.0012| ParaHippocampa_R 4112    | 0.0099| 4.1E-05| 0.0001|
| Frontal_Inf_Oper_R 2302  | 0.0044| 0.0011| 0.0007| Amygdala_L 4201          | 0.0076| 5.39E-05| 0.0001|
| Frontal_Inf_Tri_L 2311   | 0.0042| 0.0011| 0.0007| Amygdala_R 4202          | 0.0052| -     | -     |
| Frontal_Inf_Tri_R 2312   | 0.0041| 0.0011| 0.0007| Calcarine_L 5001         | 0.0160| 0.0120| 0.0203|
| Frontal_Inf_Orb_L 2321   | 0.0032| 0.0001| 0.0002| Calcarine_R 5002         | 0.0154| 0.0071| 0.0116|
| Frontal_Inf_Orb_R 2322   | 0.0036| 0.0011| 0.0029| Cuneus_L 5011            | 0.0085| 0.0107| 0.0144|
| Rolandic_Oper_L 2331     | 0.0049| 0.0011| 0.0029| Cuneus_R 5012            | 0.0085| 0.0078| 0.0099|
| Rolandic_Oper_R 2332     | 0.0038| -     | -     | Lingual_L 5021           | 0.0226| 0.0146| 0.0234|
| Supp_Motor_Area_L 2401   | 0.0027| 4.42E-05| 6.41E-05| Lingual_R 5022        | 0.0212| 0.0098| 0.0126|
| Supp_Motor_Area_R 2402   | 0.0020| 2.48E-05| -     | Occipital_Sup_L 5101     | 0.0075| 0.0179| 0.0242|


| Brain Region                  | Value 1    | Value 2   | Value 3   | Value 4   | Value 5   | Value 6   | Value 7   | Value 8   | Value 9   | Value 10  |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Olfactory_L 2501             | 0.0058    | 2.48E-05  | 2.8E-05   |           |           |           |           |           |           |           |
| Olfactory_R 2502             | 0.0058    |           |           |           |           |           |           |           |           |
| Frontal_Sup_Med_Temporal_L 2601 | 0.0066   |           |           |           |           |           |           |           |           |
| Frontal_Sup_Med_Temporal_R 2602 | 0.0054   |           |           |           |           |           |           |           |           |
| Frontal_Med_Orbital_L 2611    | 0.0039    |           |           |           |           |           |           |           |           |
| Rectus_L 2701                 | 0.0034    |           |           |           |           |           |           |           |           |
| Rectus_R 2702                 | 0.0030    |           |           |           |           |           |           |           |           |
| Insula_L 3001                 | 0.0054    | 0.0002   | 0.0002   |           |           |           |           |           |           |
| Pallidum_L 7021               | 0.0062    |           |           |           |           |           |           |           |           |
| Pallidum_R 7022               | 0.0061    |           |           |           |           |           |           |           |           |
| Thalamus_L 7101               | 0.0064    | 4.57E-05 |           |           |           |           |           |           |           |
| Thalamus_R 7102               | 0.0065    | 6E-05    |           |           |           |           |           |           |           |
| Heschl_L 8101                 | 0.0071    | 0.0012   | 0.0023   |           |           |           |           |           |           |
| Heschl_R 8102                 | 0.0062    |           |           |           |           |           |           |           |           |
| Temporal_Sup_L 8111           | 0.0093    | 0.0109   | 0.0144   |           |           |           |           |           |           |
| Temporal_Sup_R 8112           | 0.0093    | 0.0004   | 0.0004   |           |           |           |           |           |           |
| Temporal_Pole_Sup_L 8121      | 0.0057    | 0.0003   | 0.0011   |           |           |           |           |           |           |
| Temporal_Pole_Sup_R 8122      | 0.0050    |           |           |           |           |           |           |           |           |
| Temporal_Mid_L 8201           | 0.0143    | 0.0418   | 0.0480   |           |           |           |           |           |           |
| Temporal_Mid_R 8202           | 0.0150    | 0.0047   | 0.0054   |           |           |           |           |           |           |
| Temporal_Pole_Mid_L 8211      | 0.0088    | 0.0008   | 0.0033   |           |           |           |           |           |           |
| Temporal_Pole_Mid_R 8212      | 0.0080    | 5.03E-05 |           |           |           |           |           |           |           |
| Temporal_Inf_L 8301           | 0.0125    | 0.0343   | 0.0395   |           |           |           |           |           |           |
| Temporal_Inf_R 8302           | 0.0146    | 0.0056   | 0.0068   |           |           |           |           |           |           |
| Cerebelum_Crus1_R 9001        | 0.0165    | 0.0323   | 0.0325   |           |           |           |           |           |           |
| Cerebelum_Crus1_R 9002        | 0.0157    | 0.0069   | 0.0071   |           |           |           |           |           |           |
### Table S3: MNI coordinates of the clusters for the comparison FEP>HC.

| Location       | x/y/z (mm) | P_FWE_corr | P_FDR_corr | T_score | Cluster size |
|----------------|------------|------------|------------|---------|--------------|
| Temporal pole  | -54/-42/-12| 0.000      | 0.000      | 8.09    | 4            |
| FuG            | -42/-54/-9 | 0.002      | 0.146 (0.004 in cluster level) | 6.02    | 6            |
| LiG            | -21.7/-67.5/13.12 | 0.000 | 0.000 | 5.69 | 4            |
| Right PCgG     | 4.7/-40.0/5 | 0.005 | 0.112 (0.008 in cluster level) | 6.12 | 5            |

### Table S4: MNI coordinates of the clusters for the comparison CHR>HC.

| Location       | x/y/z (mm) | P_FWE_corr | P_FDR_corr | T_score | Cluster size |
|----------------|------------|------------|------------|---------|--------------|
| Temporal pole  | -54/-68/6  | <0.000     | <0.046     | 6.88    | 13           |
| Occipital pole | -51/-62/5  | <0.0100    | <0.046     | 6.83    | 8            |

### Table S5: Statistical results of the VBM analysis for the contrast FEP>HC.

| Location       | x/y/z (mm) | P_FWE_corr | P_FDR_corr | T_score | Cluster size |
|----------------|------------|------------|------------|---------|--------------|
| Right Cerebellum | 39/-62/-35 | <0.000     | <0.000     | 9.47    | 917           |
| Left Cerebellum Exterior | -39/63/-33 | <0.000 | <0.001 | 7.03 | 131 |

**Figure S1:** The histogram of the voxel’s intensity for all the warped and modulated images from all subjects and a zoom representation for the high intensities.

**Figure S2:** The distances from one HC subject are represented in a) and the weighted distances of the same subject in b). Both mapped in mwp1* image of the same subject. It is observed that the highest distances are located in the temporal and occipital lobe (red color). In c) the upper graph (117.119) shows the distance at the middle frontal gyrus and the lower graph shows the weighted distance (160.431). In d) the left cerebellum exterior presents distance equal to 193.315 (upper graph) and weighted distance equal to 122.072 (lower graph).
Figure S3: Scalogram of one a) FEP, b) CHR and c) HC subject for 200 scales and 100 scales. Sampled voxels are represented in x-axis and scales in y-axis, the colors represent the correlation with the Morlet wavelet deep red color corresponds to lower and white color to higher correlation.

Figure S4: Individual scalograms of all analyzed FEP patients, CHR and HC subjects, deep red color corresponds to lower and white color to higher correlation.
