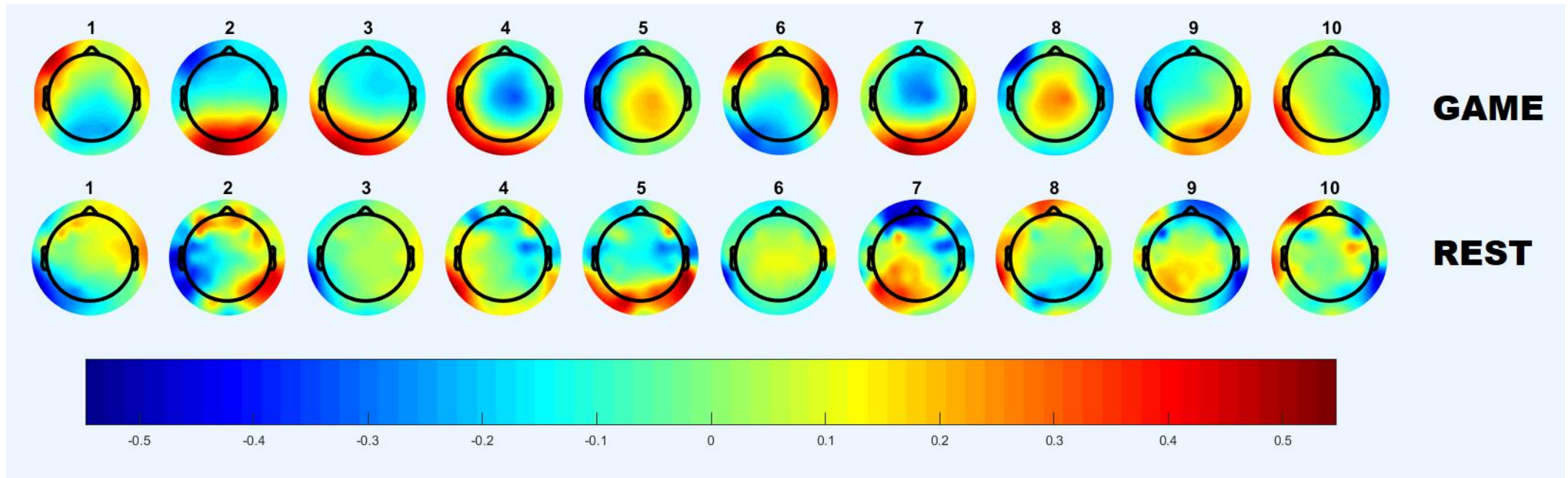


BRAIN ACTIVITY DURING A GAME OF BRIDGE

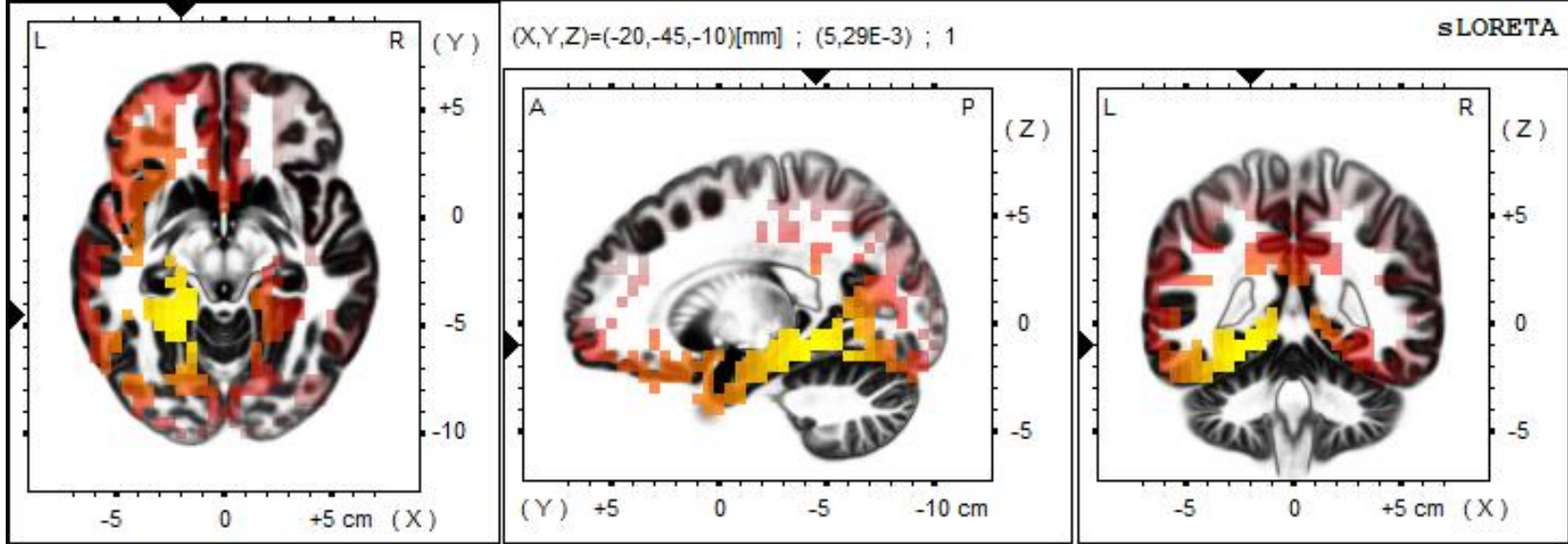


BY MARCIN HAJNOWSKI

The following presentation contains preliminary comparison of brain activity during resting state and a game of bridge, measured using 64-channel EEG. To best describe differences in brain dynamics between the two conditions (rest vs. game) we decided to employ microstate analysis. This method identifies stable and reoccurring patterns (prototypes) of global brain activation that best explain the signal variance. For both resting state and gameplay data the optimal number of 10 prototypes was identified based on global explained variance and cross-validation criterion (prototype vizualization below). Most active signal sources for each microstate prototype were identified using standardized low-resolution brain electromagnetic tomography (sLORETA). The next 10 slides show a side-by-side comparison of given microstate sources with most active structures and Brodmann areas listed.

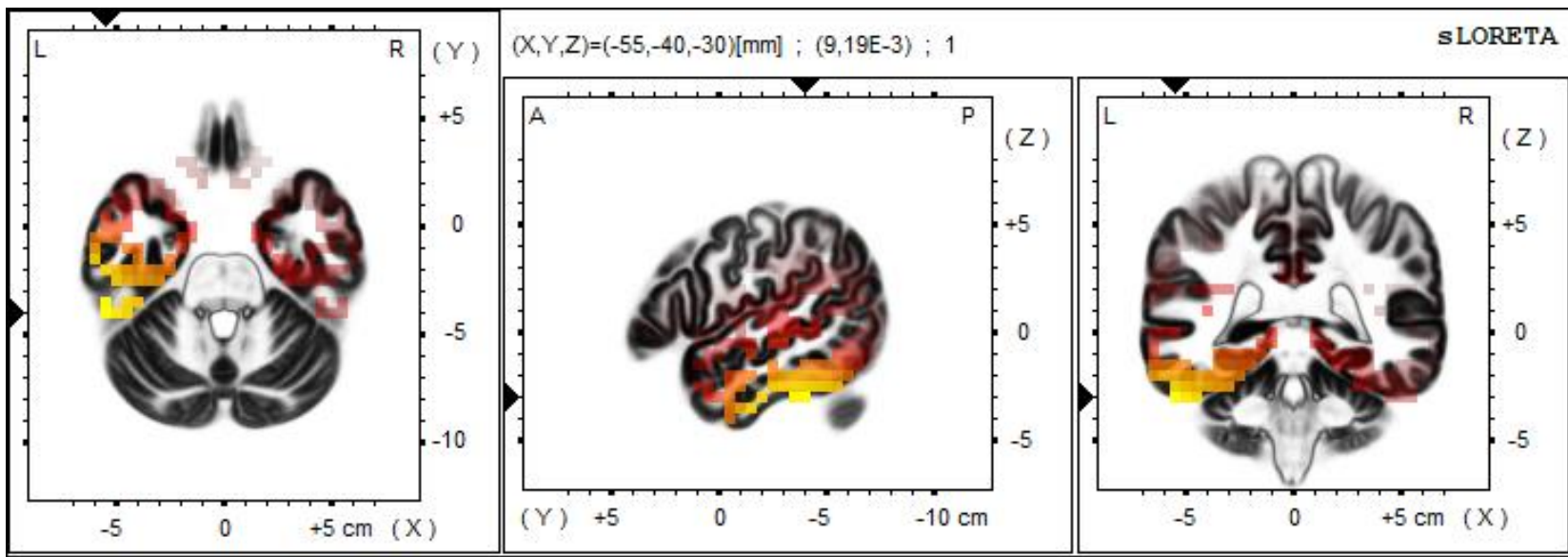


GAME



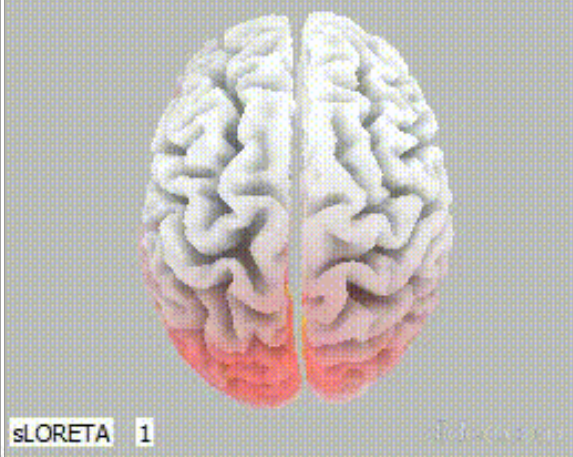
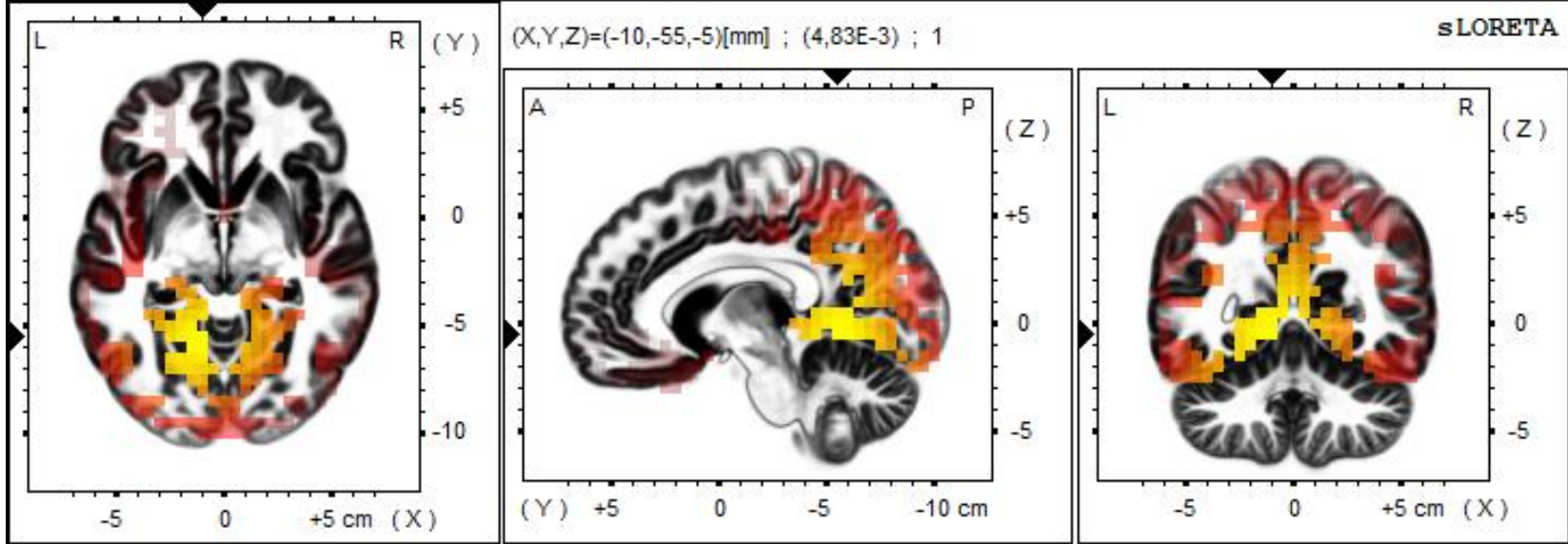
Brodmann areas: 19, 20, 30, 35, 36, 37 Structures: Parahippocampal Gyrus, Sub-Gyrus, Fusiform Gyrus, Lingual Gyrus

REST



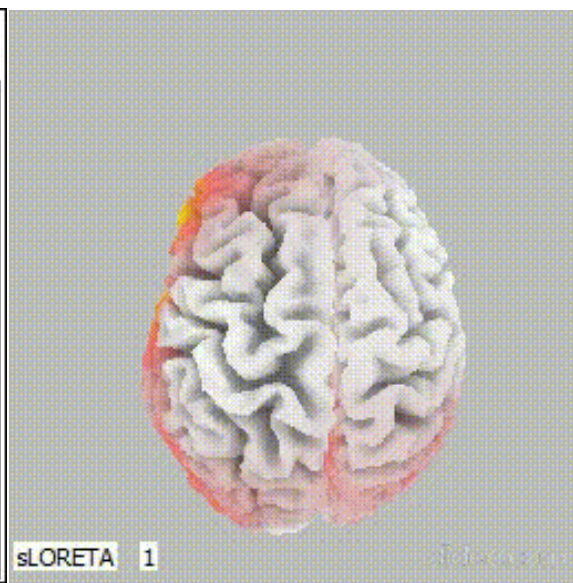
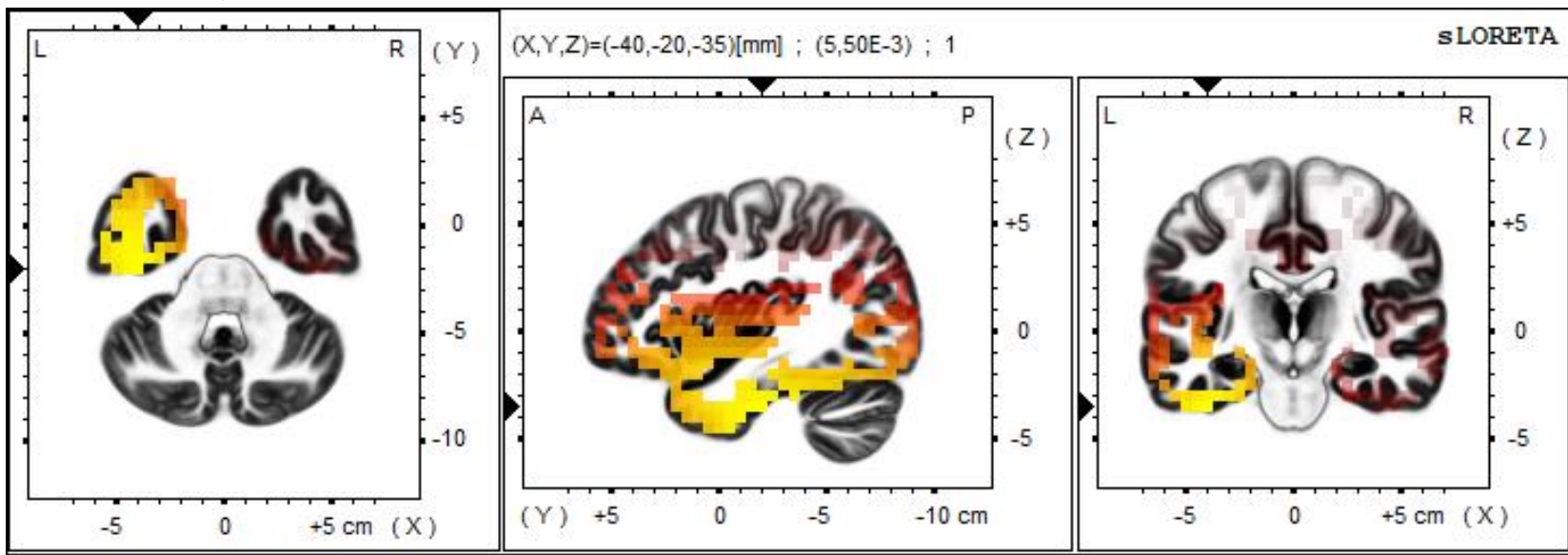
Brodmann areas: 20, 21, 36, 37 Structures: Fusiform Gyrus, Inferior Temporal Gyrus, Middle Temporal Gyrus

GAME



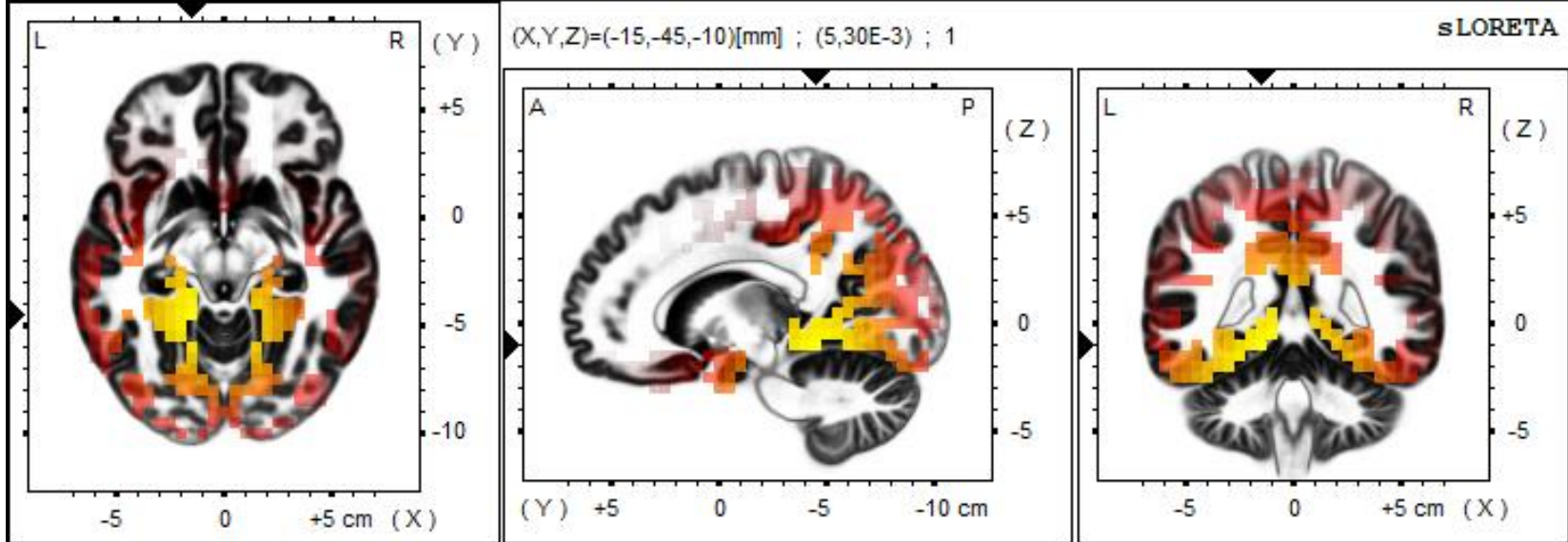
Brodmann areas: 18, 19, 29, 30 Structures: Lingual Gyrus, Posterior Cingulate, Parahippocampal Gyrus, Cuneus, Fusiform Gyrus, Sub-Gyral

REST



Brodmann areas: 20, 21, 36, 37, 47 Structures: Inferior Temporal Gyrus, Parahippocampal Gyrus, Uncus, Fusiform Gyrus, Middle Temporal Gyrus, Inferior Frontal Gyrus

GAME

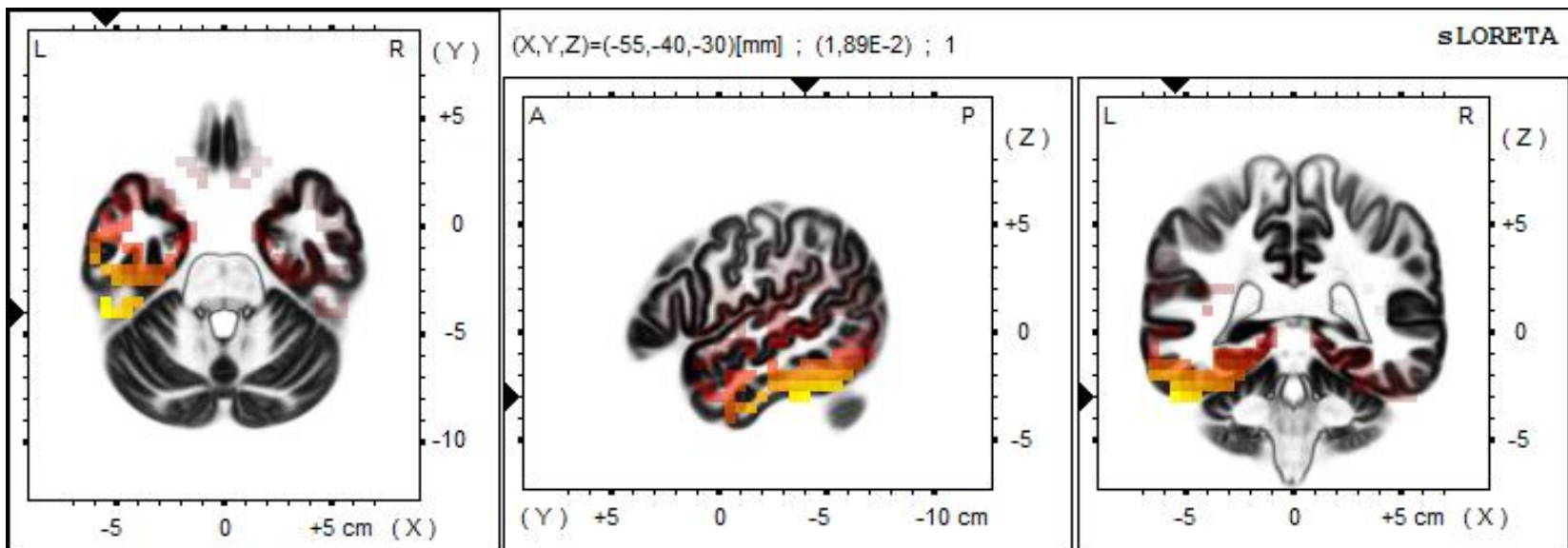


sLORETA 1

Brainstorm

Brodmann areas: : 20, 21, 36, 37 Fusiform Gyrus, Inferior Temporal Gyrus, Middle Temporal Gyrus

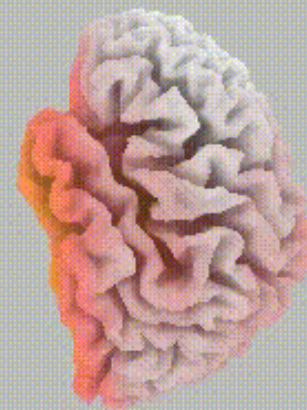
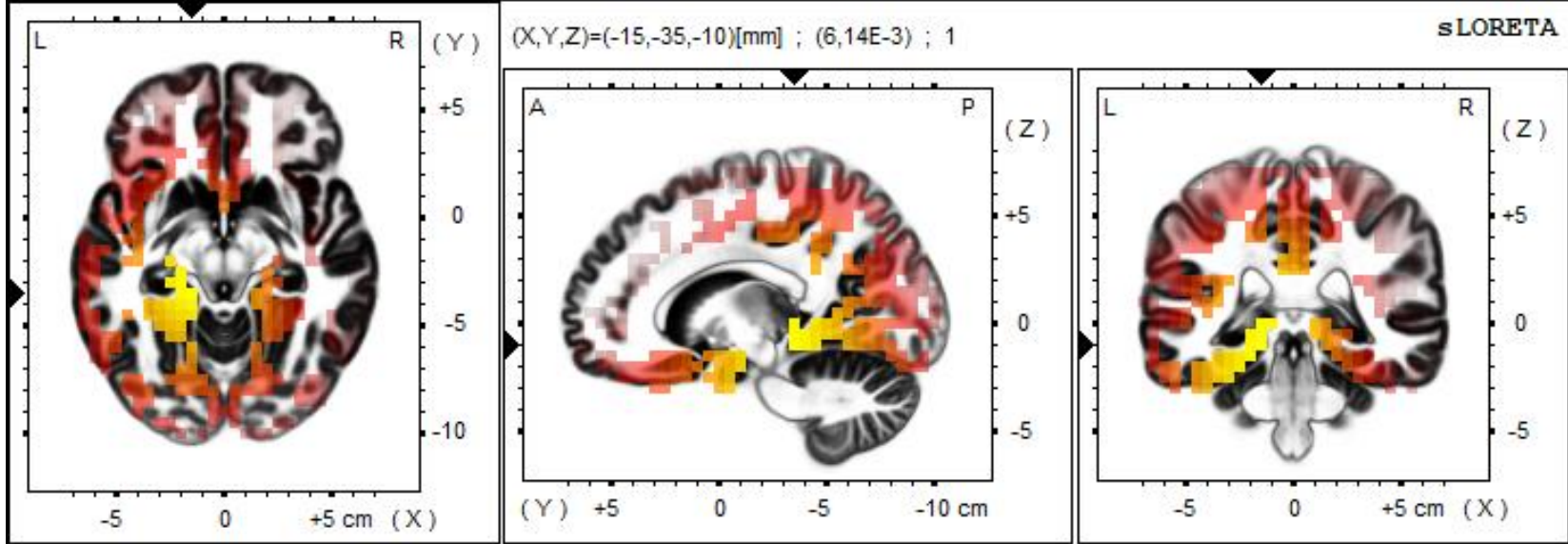
REST



sLORETA 1

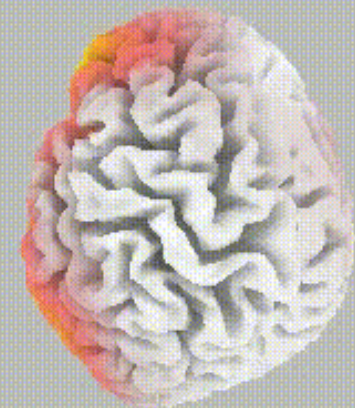
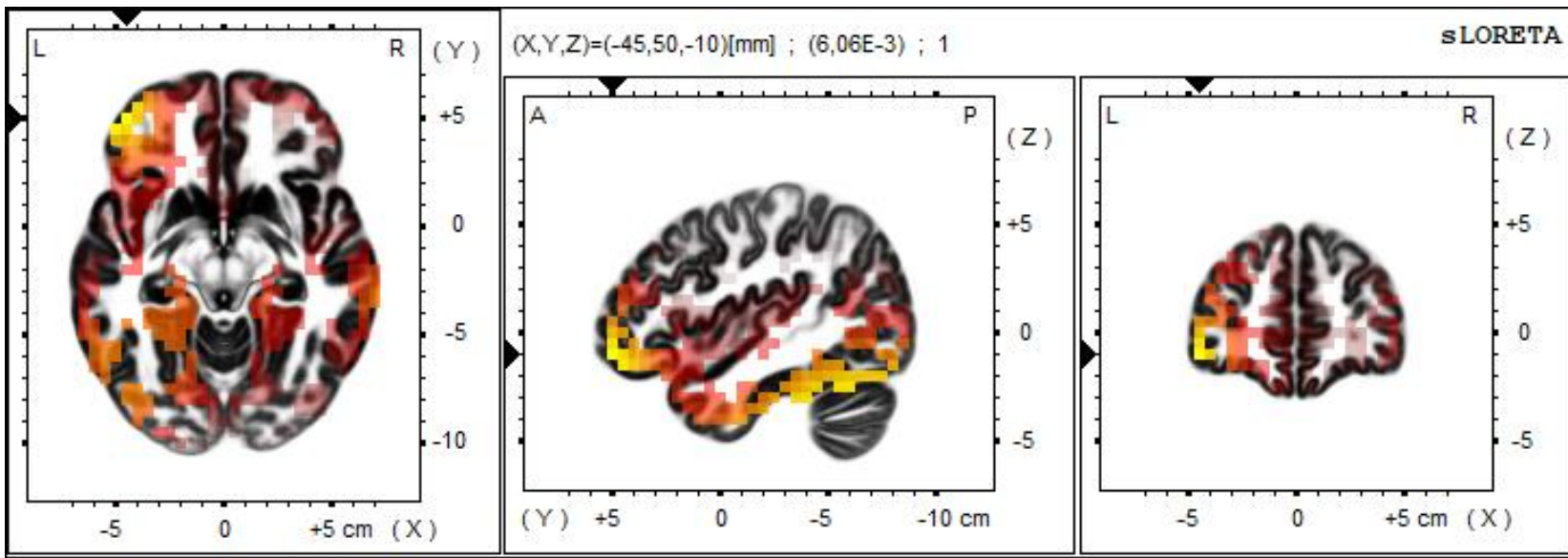
Brainstorm

GAME



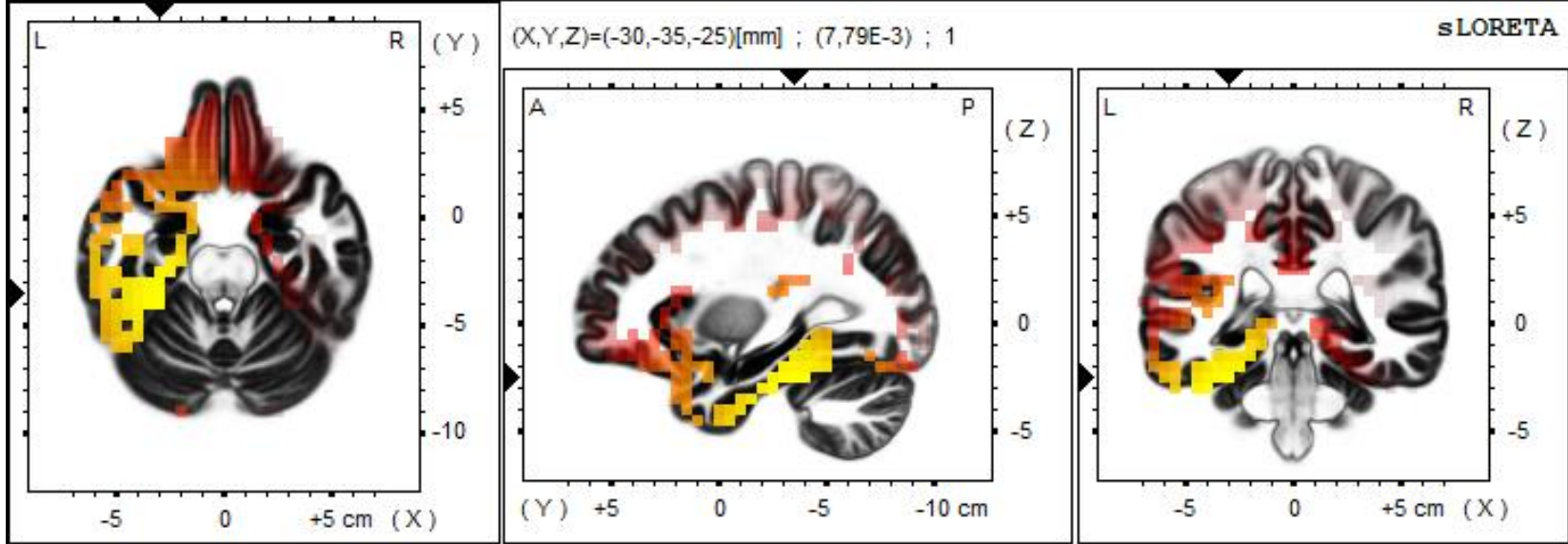
Brodmann areas: 19, 20, 27, 28, 30, 35, 36, 37 Structures: Parahippocampal Gyrus, Sub-Gyral, Lingual Gyrus, Fusiform Gyrus

REST

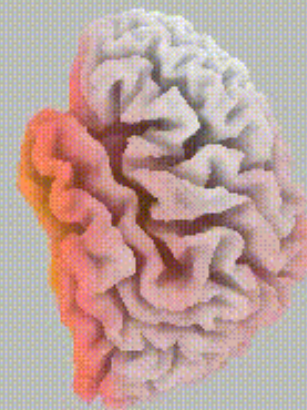


Brodmann areas: 10, 11, 19, 20, 36, 37, 47 Inferior Frontal Gyrus, Fusiform Gyrus, Inferior Temporal Gyrus, Middle Frontal Gyrus

GAME

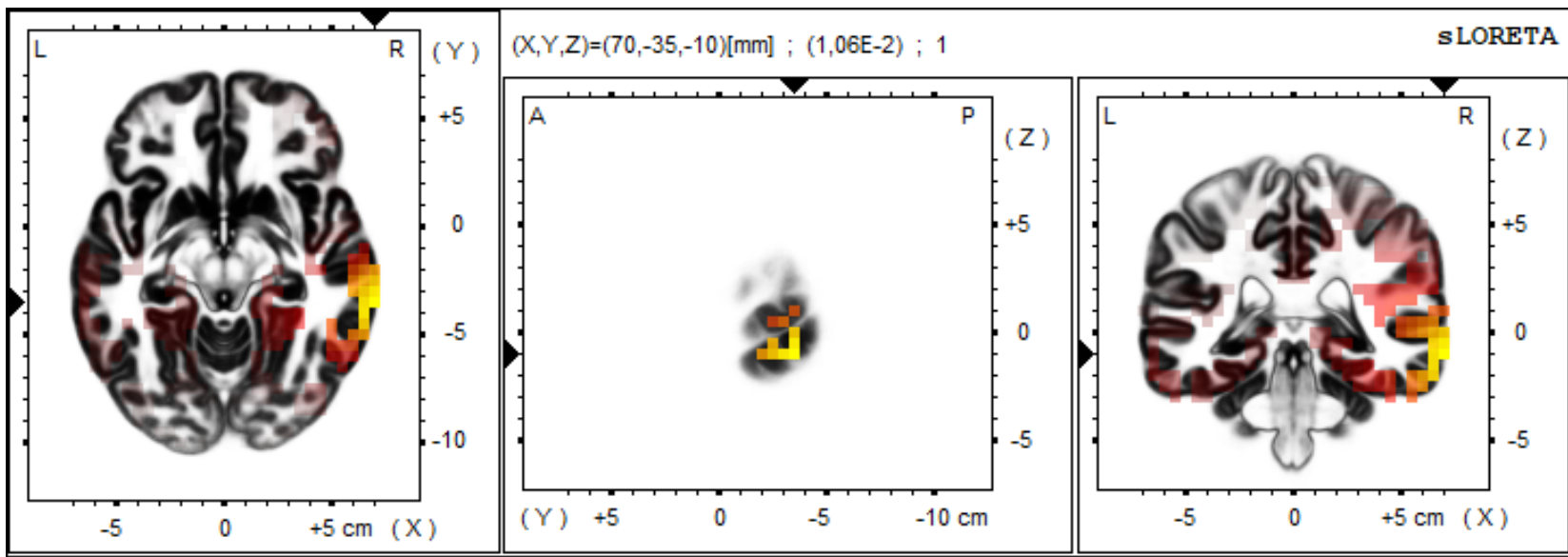


sLORETA 1

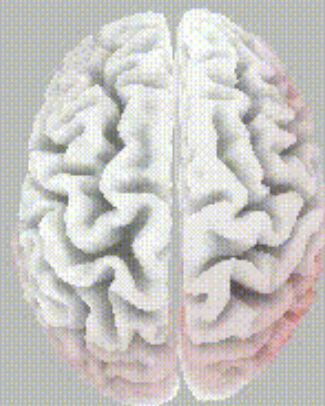


Brodmann areas: 20, 35, 36, 37 Structures: Fusiform Gyrus, Parahippocampal Gyrus, Inferior Temporal Gyrus, Uncus

REST

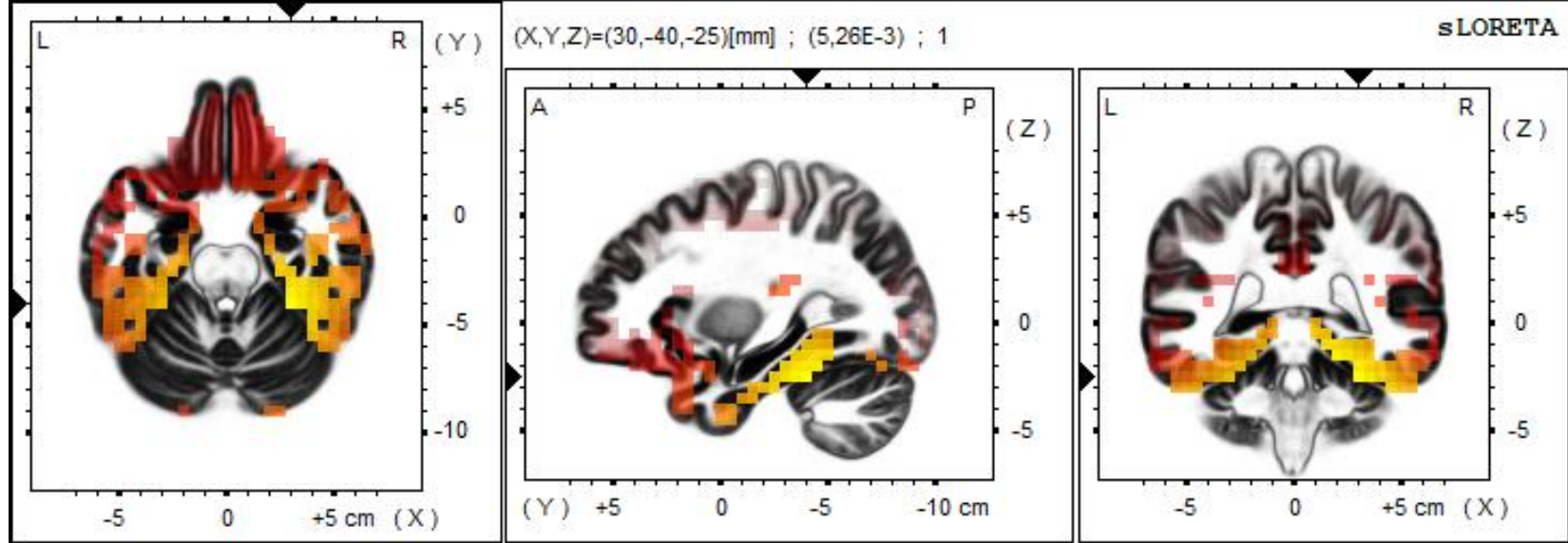


sLORETA 1



Brodmann areas: 20, 21, 22 Structures: Inferior Temporal Gyrus, Middle Temporal Gyrus, Superior Temporal Gyrus

GAME

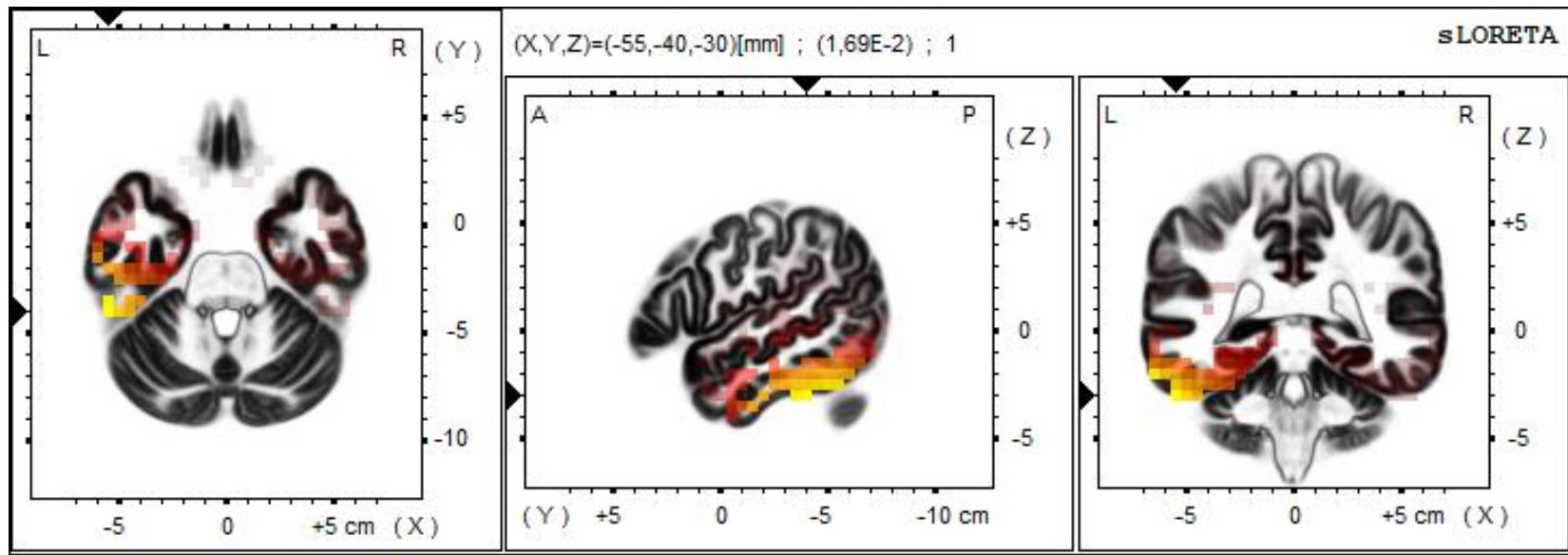


sLORETA 1

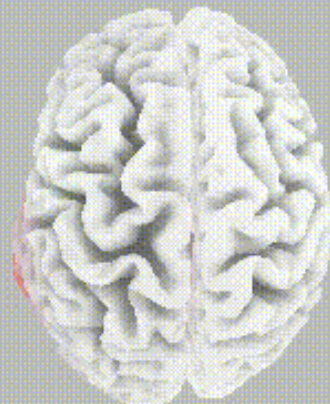


Brodmann areas: : 19, 20, 29, 30, 35, 36, 37 Structures: Fusiform Gyrus, Parahippocampal Gyrus

REST

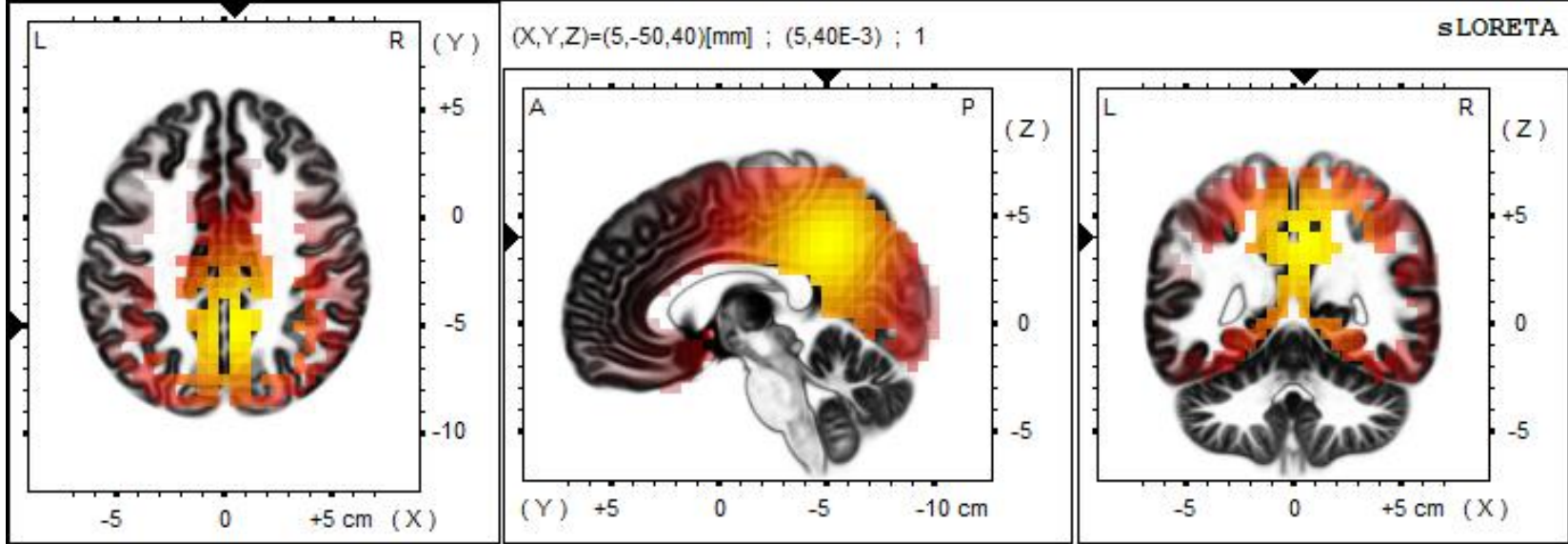


sLORETA 1



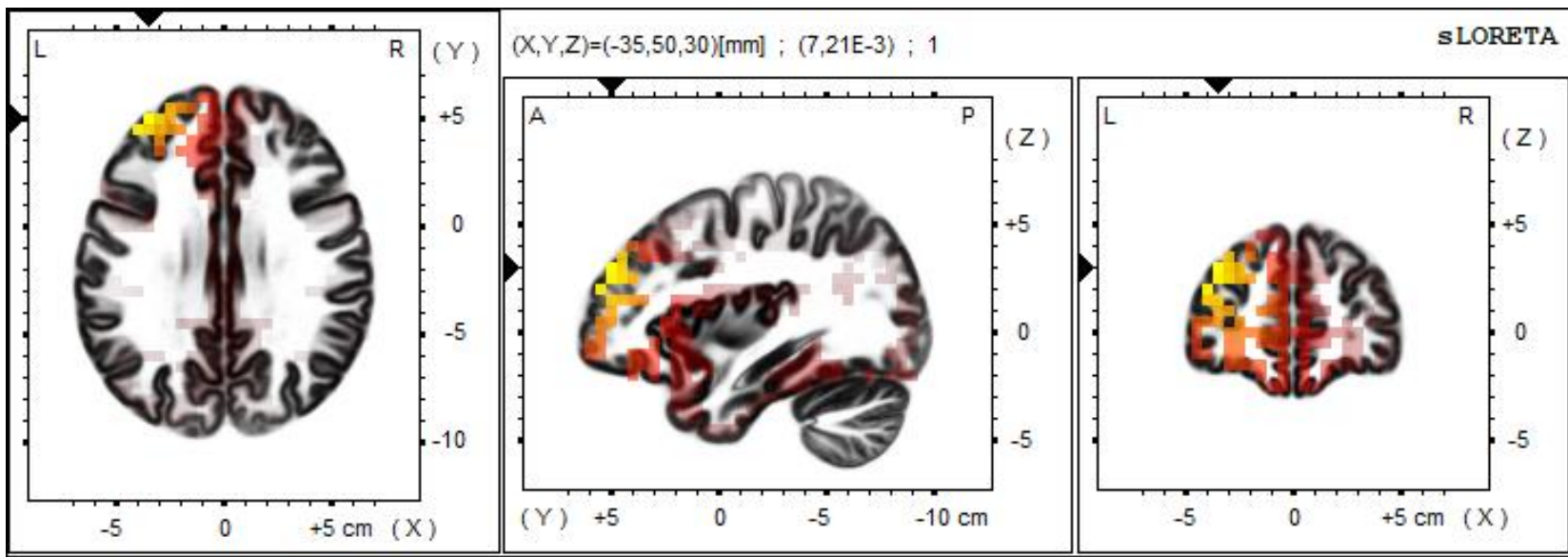
Brodmann areas: 20, 21, 36, 37 Structures: Fusiform Gyrus, Inferior Temporal Gyrus, Middle Temporal Gyrus

GAME



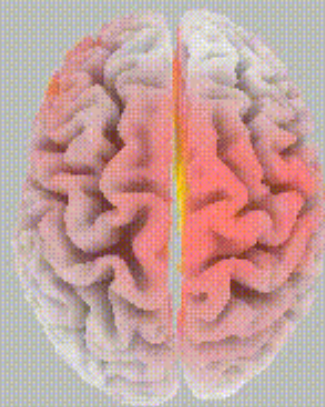
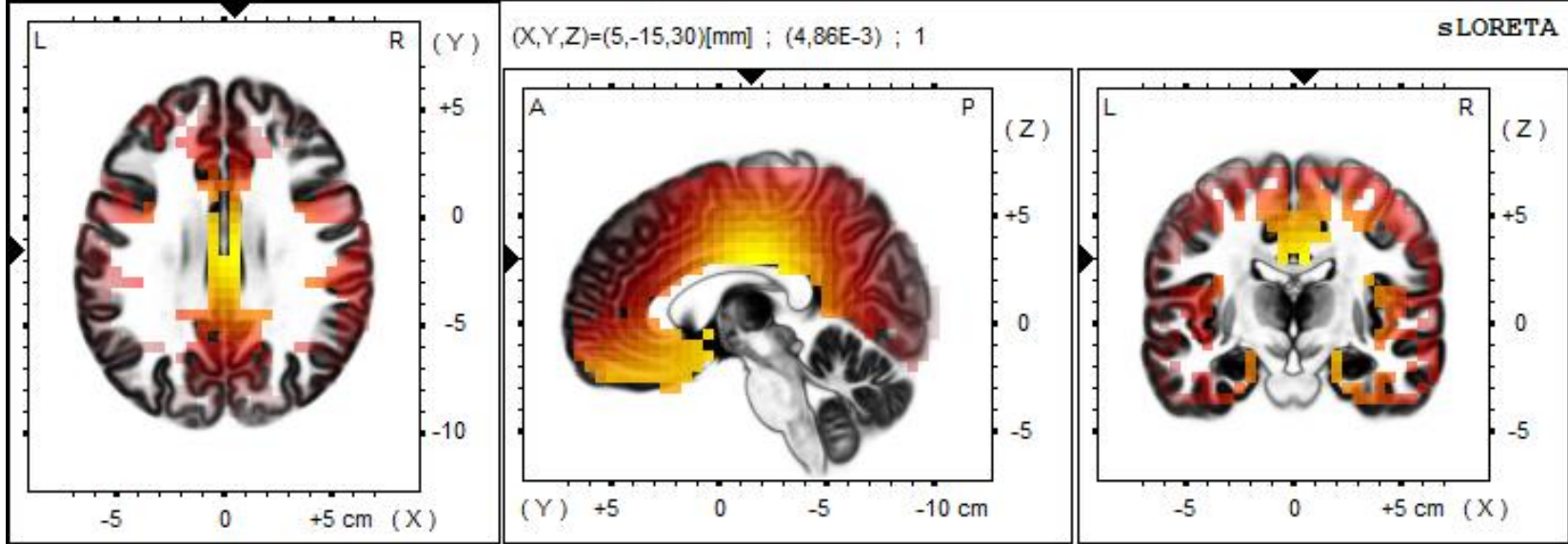
Brodmann areas: 7, 23, 31 Structures: Cingulate Gyrus, Precuneus, Posterior Cingulate

REST



Brodmann areas: 9, 10, 46 Structures: Superior Frontal Gyrus, Middle Frontal Gyrus

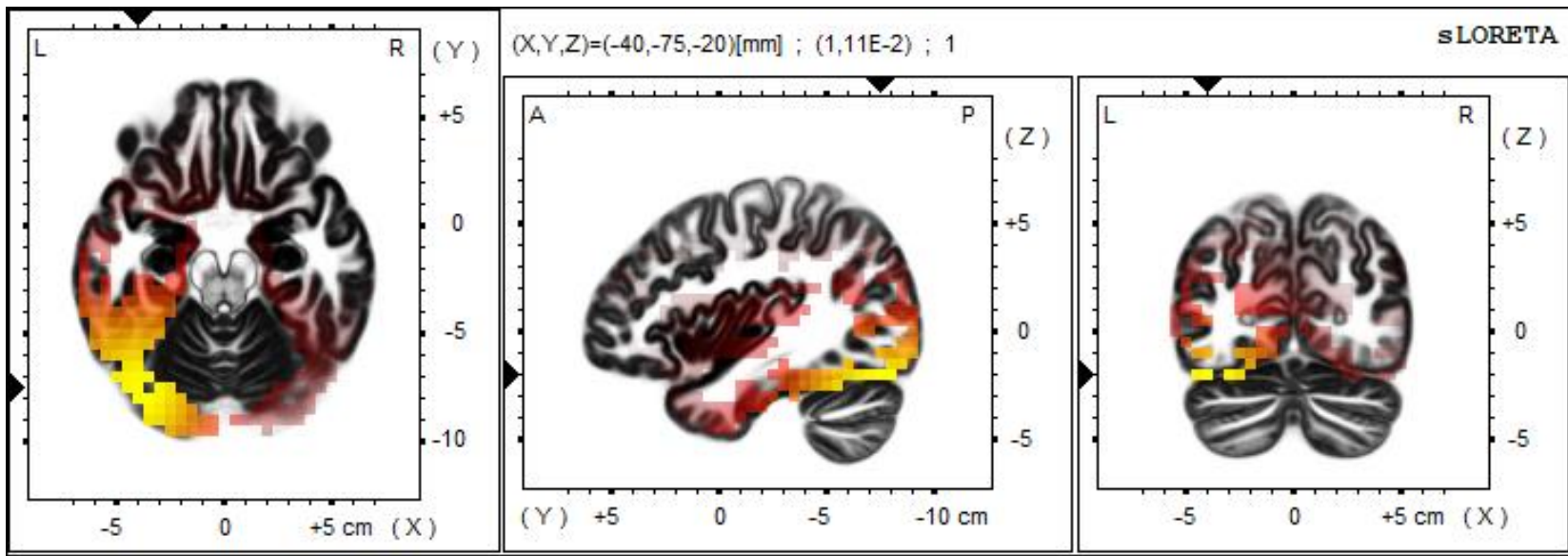
GAME



sLORETA 1

Brodmann areas: 11, 23, 24, 25 Structures: Posterior Cingulate, Cingulate Gyrus, Anterior Cingulate, Parahippocampal Gyrus, Subcallosal Gyrus, Rectal Gyrus

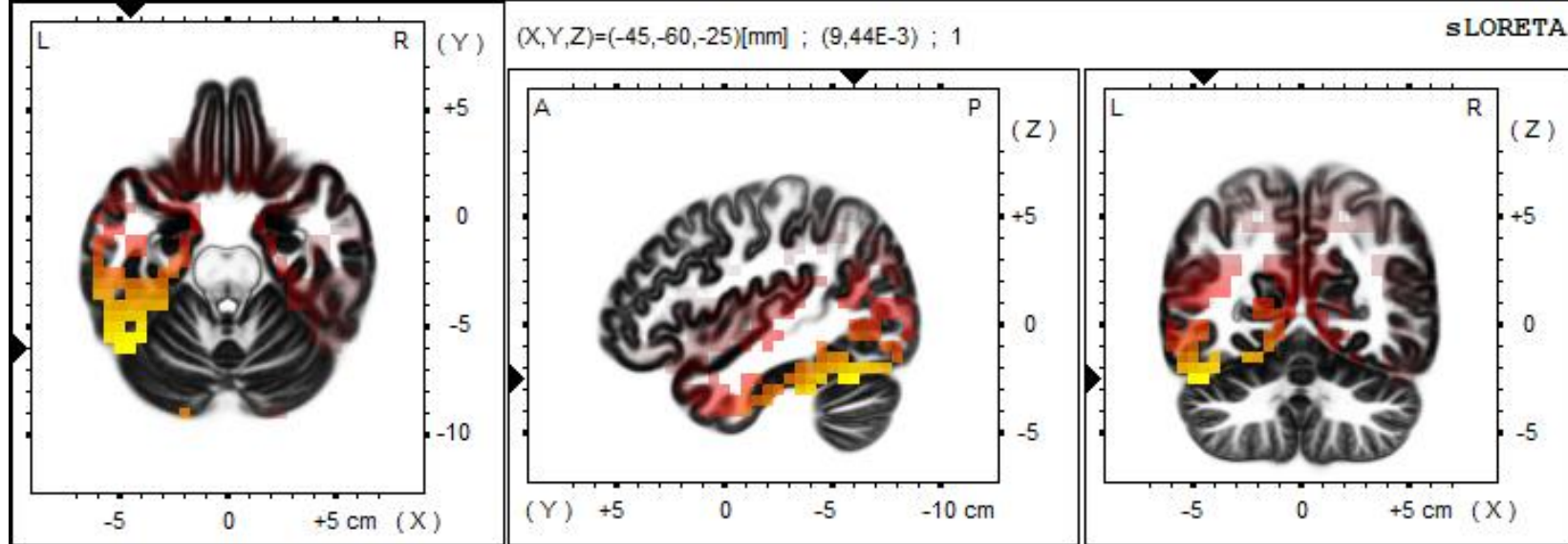
REST



sLORETA 1

Brodmann areas: 18, 19, 37 Structures: Fusiform Gyrus, Inferior Occipital Gyrus, Middle Occipital Gyrus, Lingual Gyrus

GAME



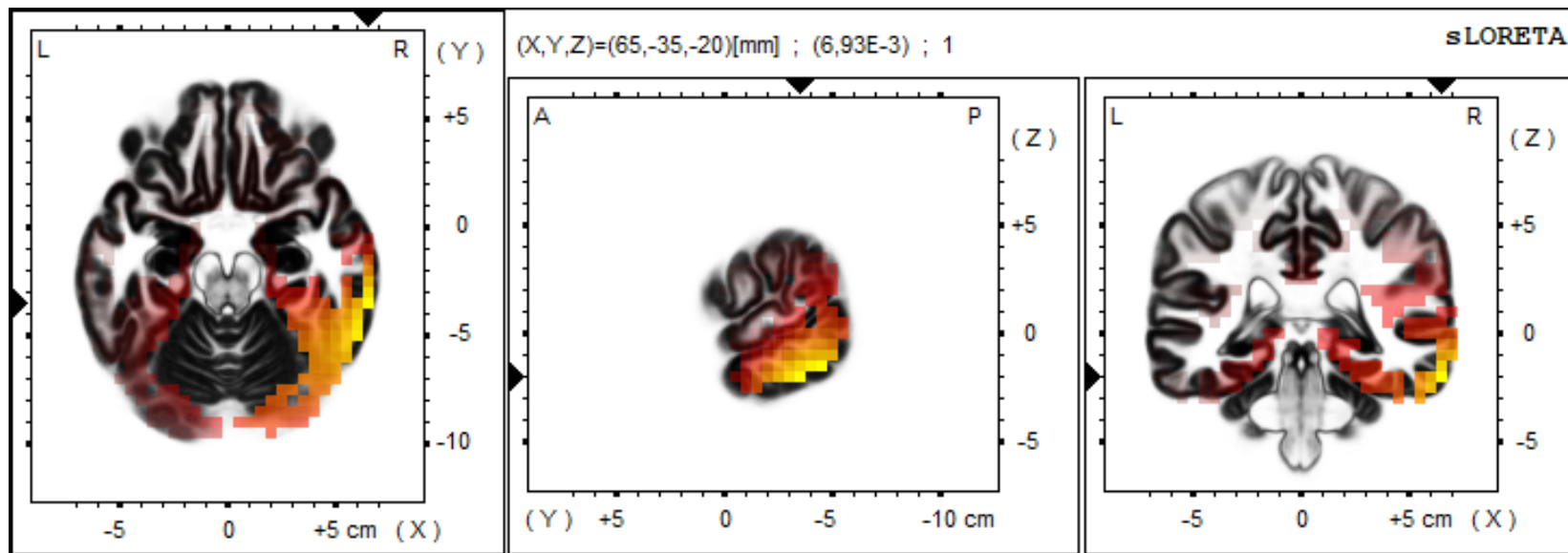
sLORETA 1



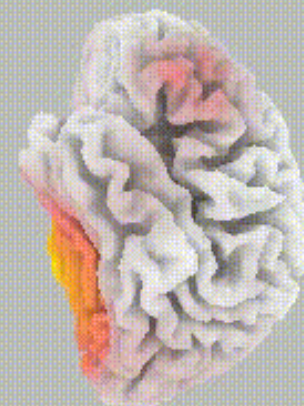
Brainstorm

Brodmann areas: 19, 20, 36, 37 Structures: Fusiform Gyrus, Inferior Temporal Gyrus

REST



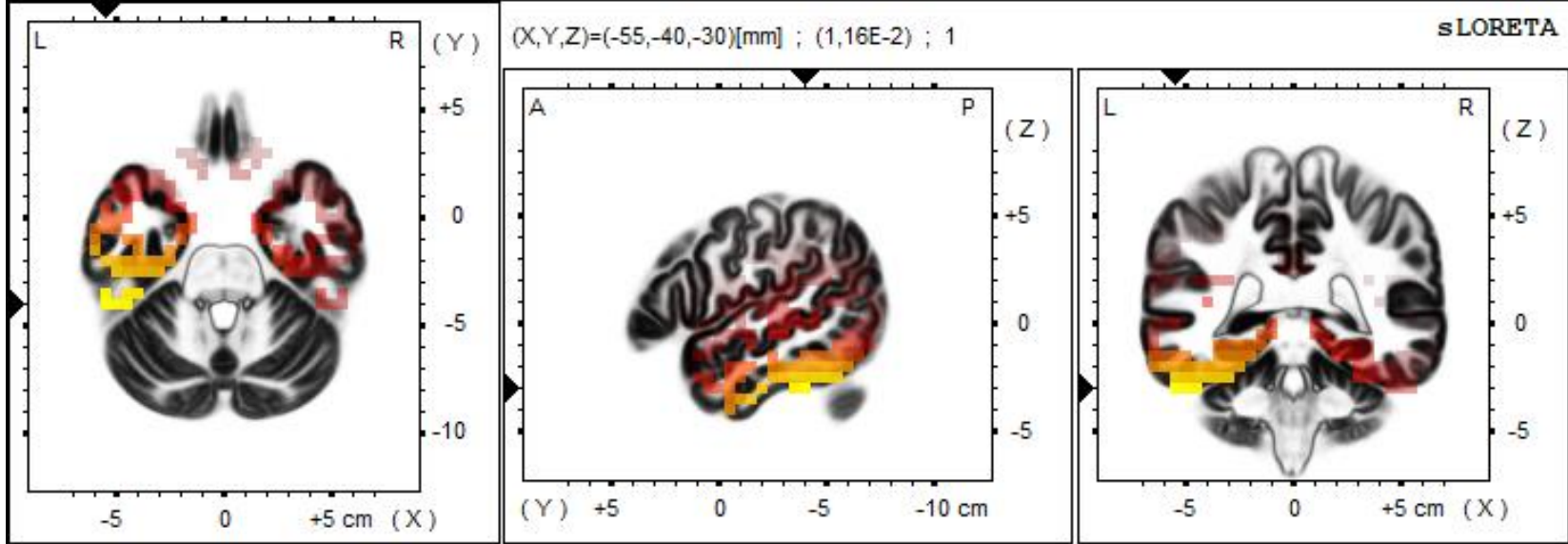
sLORETA 1



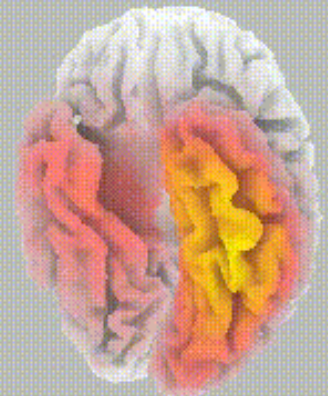
Brainstorm

Brodmann areas: 19, 20, 21, 37 Structures: Middle Temporal Gyrus, Inferior Temporal Gyrus, Fusiform Gyrus

GAME

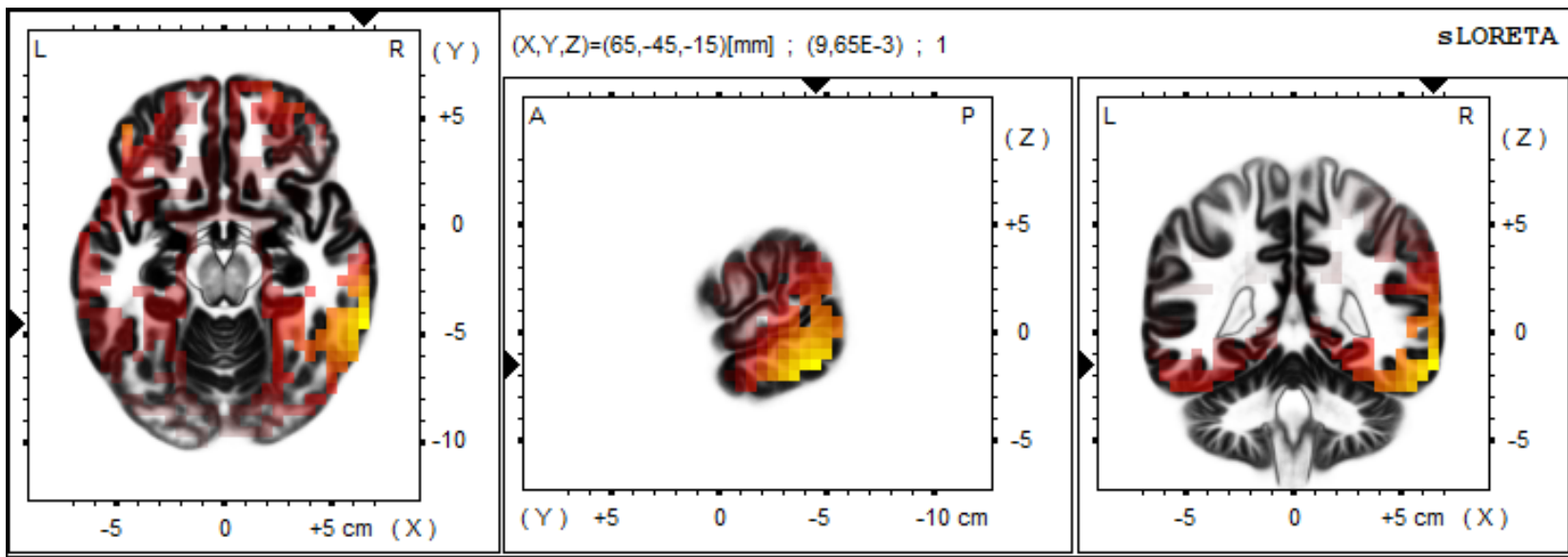


sLORETA 1

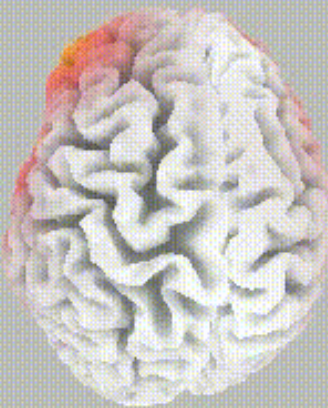


Brodmann areas: 20, 36, 37 Structures: Fusiform Gyrus, Inferior Temporal Gyrus, Parahippocampal Gyrus

REST



sLORETA 1



Brodmann areas: 20, 21, 37 Structures: Middle Temporal Gyrus, Inferior Temporal Gyrus, Fusiform Gyrus