**Source\_ana output discription**

**1. Statistical Results (CSV Files)**

**Individual Protocol Statistics:**

**involvement\_statistics.csv**: Contains statistics about wave involvement for each protocol and stage

* + *Mean\_Involvement*: Average percentage of total voxels (the brain) involved in waves
  + *Median\_Involvement*: Median percentage of total voxels involved
  + *Std\_Involvement*: Standard deviation of involvement percentages
  + *Count*: Number of waves
* **[protocol]\_origin\_statistics.csv**: For each protocol, shows the probability of regions that likely contain the true origin of the slow wave detected (the probabilistic representation of the origin of the slow wave)
  + *Region*: Brain region name
  + *Count*: Times of that region counted as origin (earliest 10%) for a wave
  + *Total\_Waves*: Total number of waves analyzed
  + *Percentage*: probability of regions that likely contain the true origin of the slow wave detected (Count/Total waves)
* **statistical\_test\_results.csv**: Results of statistical tests comparing stages
  + Kruskal-Wallis tests, Mann-Whitney U tests, and Chi-Square tests. (For involvement: Kruskal-Wallis tests whether group means ranks are different, which is widely used as the non-parametric version of ANOVA. If Kruskal-Wallis shows significance, Mann-Whitney U tests conduct a pair-wise comparison to specify what is different. For origin: Chi-Square tests for difference between non-parametric categorical data)  
    The potential problem here: 1, ANOVA tests for the mean itself, not the rank; 2, Chi-Square only compare categories (ROIs), not the probability; for example, superiorfrontal L 100% and superiorfrontal L 30% will not be differentiated

**Meta Protocol Statistics (Protocols collapsed)**

**2. Visualizations (PNG Files)**

* **involvement\_by\_protocol\_and\_stage.png**: Boxplot showing involvement percentages
* **origins\_[protocol].png**: Horizontal bar charts showing origin regions for each protocol
* **involvement\_summary.png**: Summary bar chart of mean involvement
* **meta\_involvement\_boxplot.png**: Boxplot of involvement for protocols collapsed data
* **origins\_meta.png**: Horizontal bar chart of origins for protocols collapsed data  
  Essentially, I treat the protocols collapsed group (waves from all protocols=312 only separated into Pre=130, Early=31, Late=42, post=109) as a new protocol (called meta) and perform the same analysis.