

Linking neuronal avalanches with oscillatory and broadband 1/f activities in the resting human brain

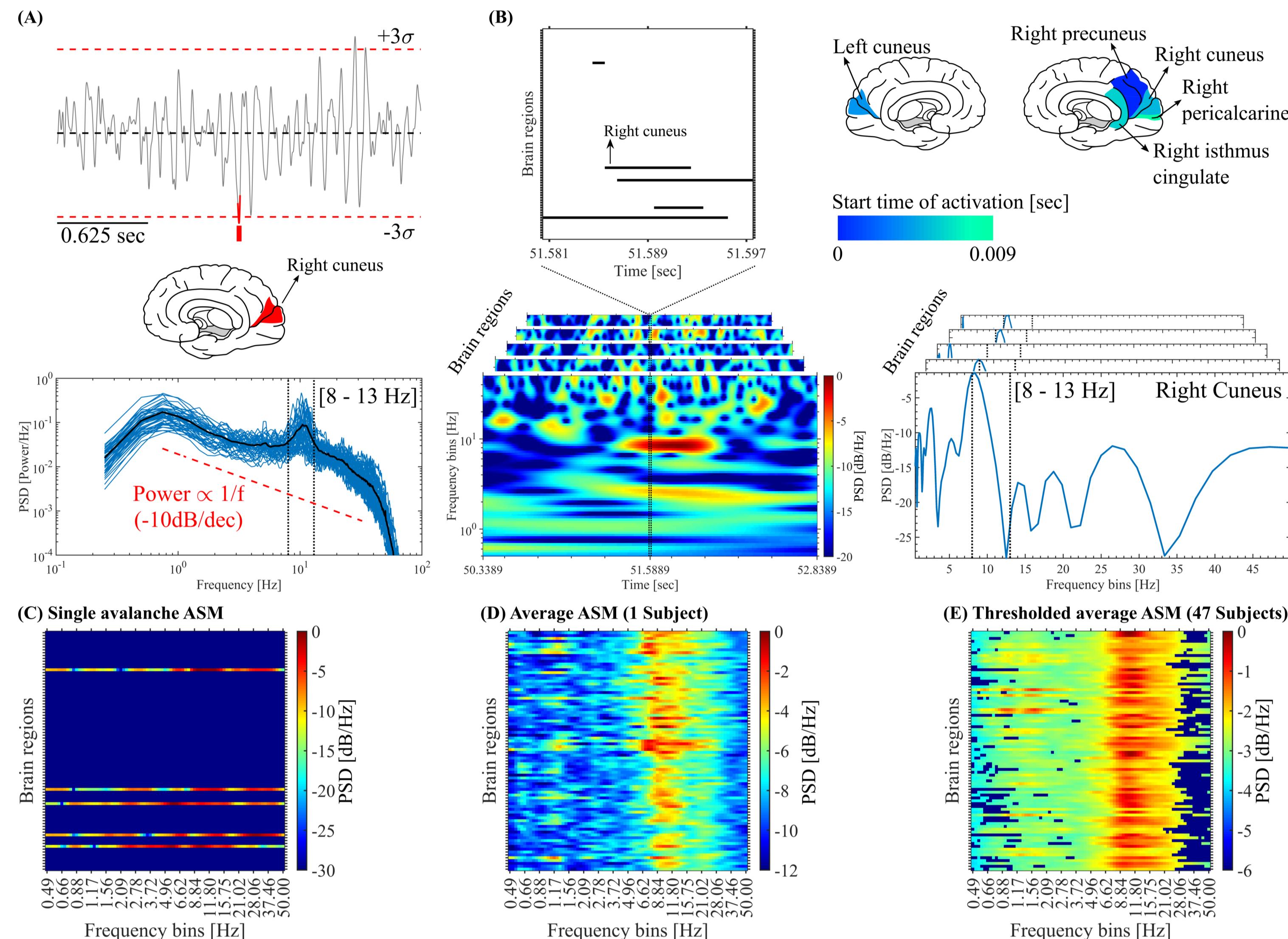


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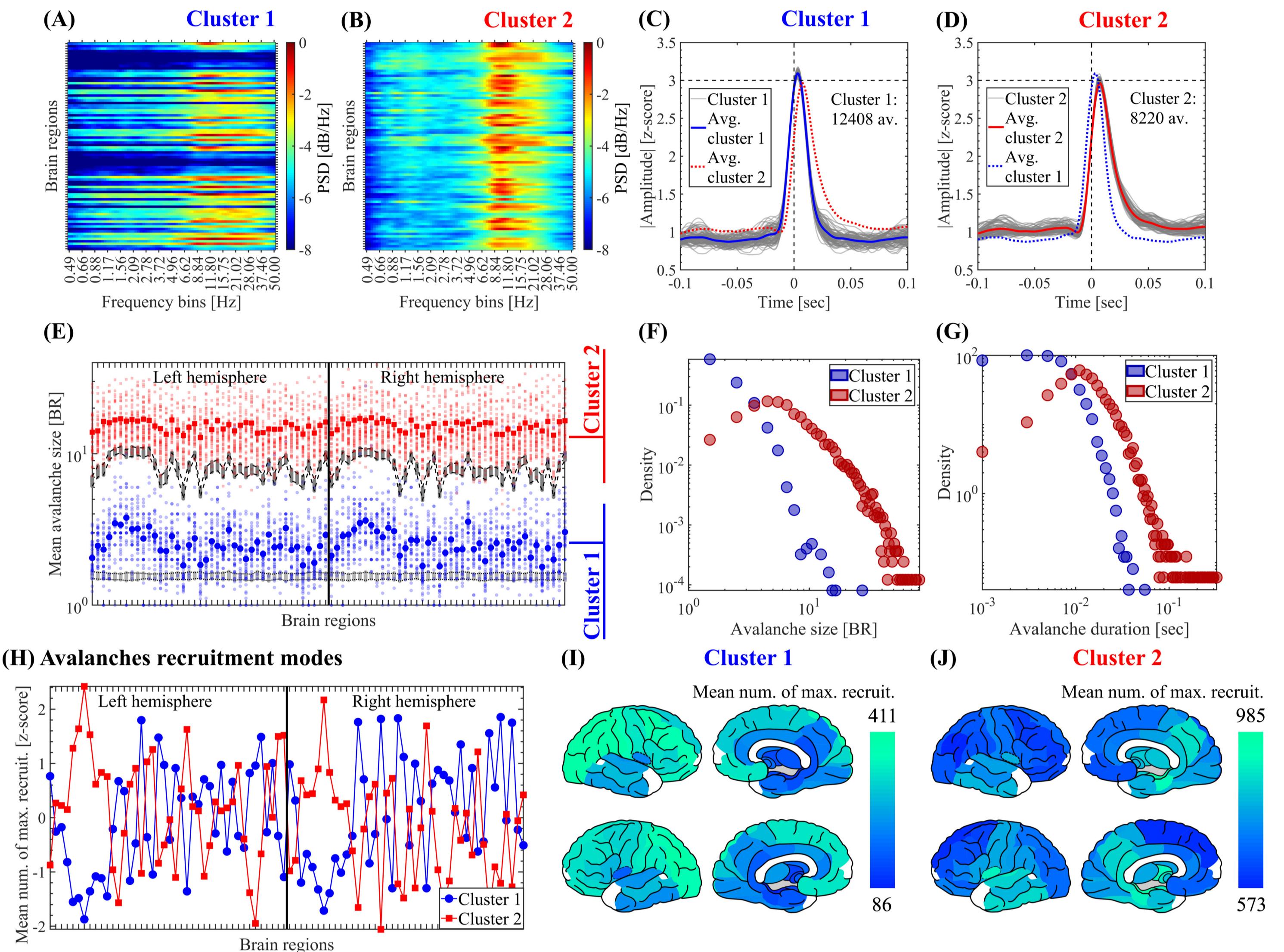


Intro: We analyzed source-reconstructed MEG data from 47 subjects. Neuronal Avalanches (NAs) were characterized as salient network events without implying a connection to the brain criticality hypothesis.

Methods: Spectral characterization of NAs



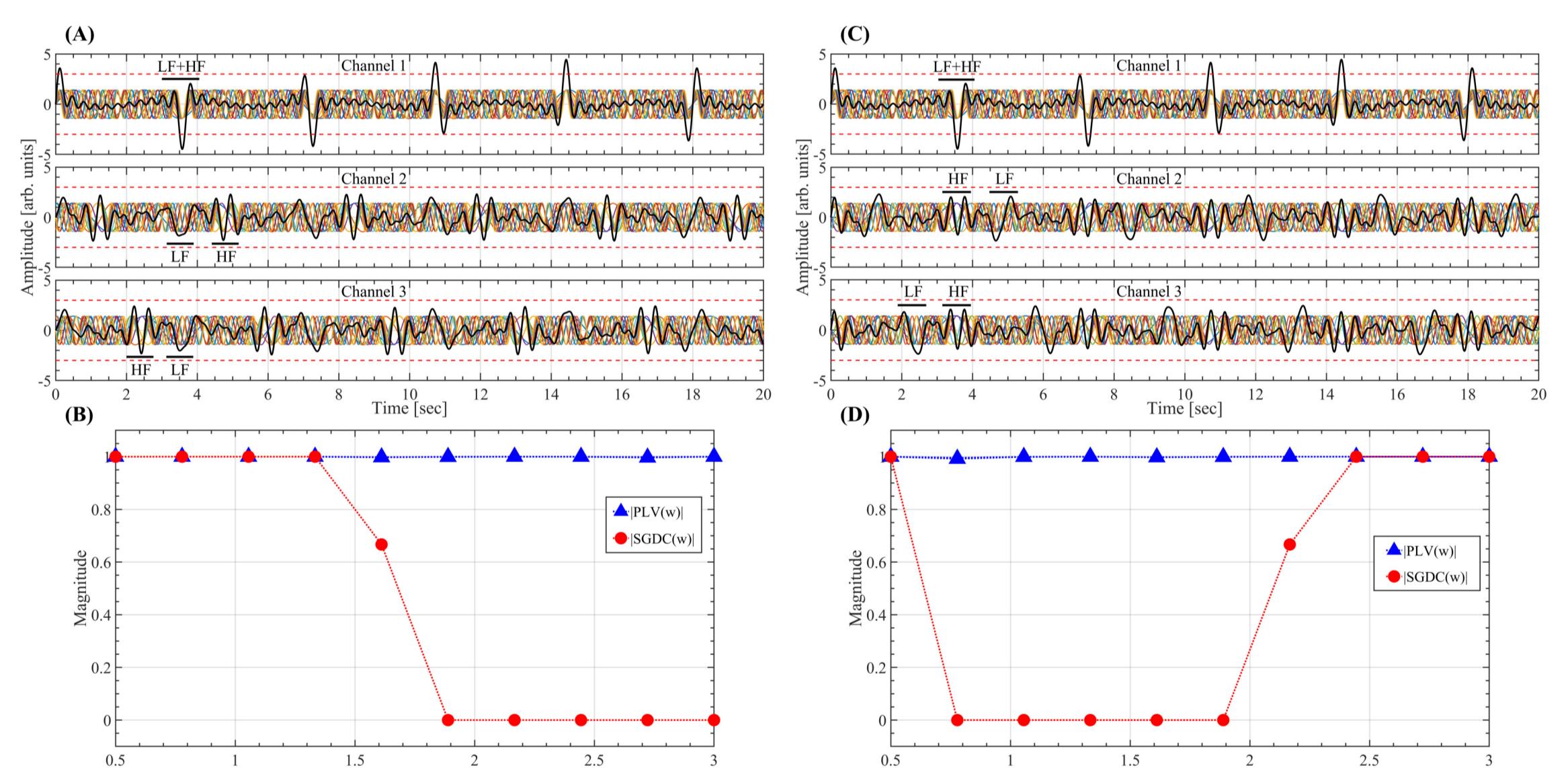
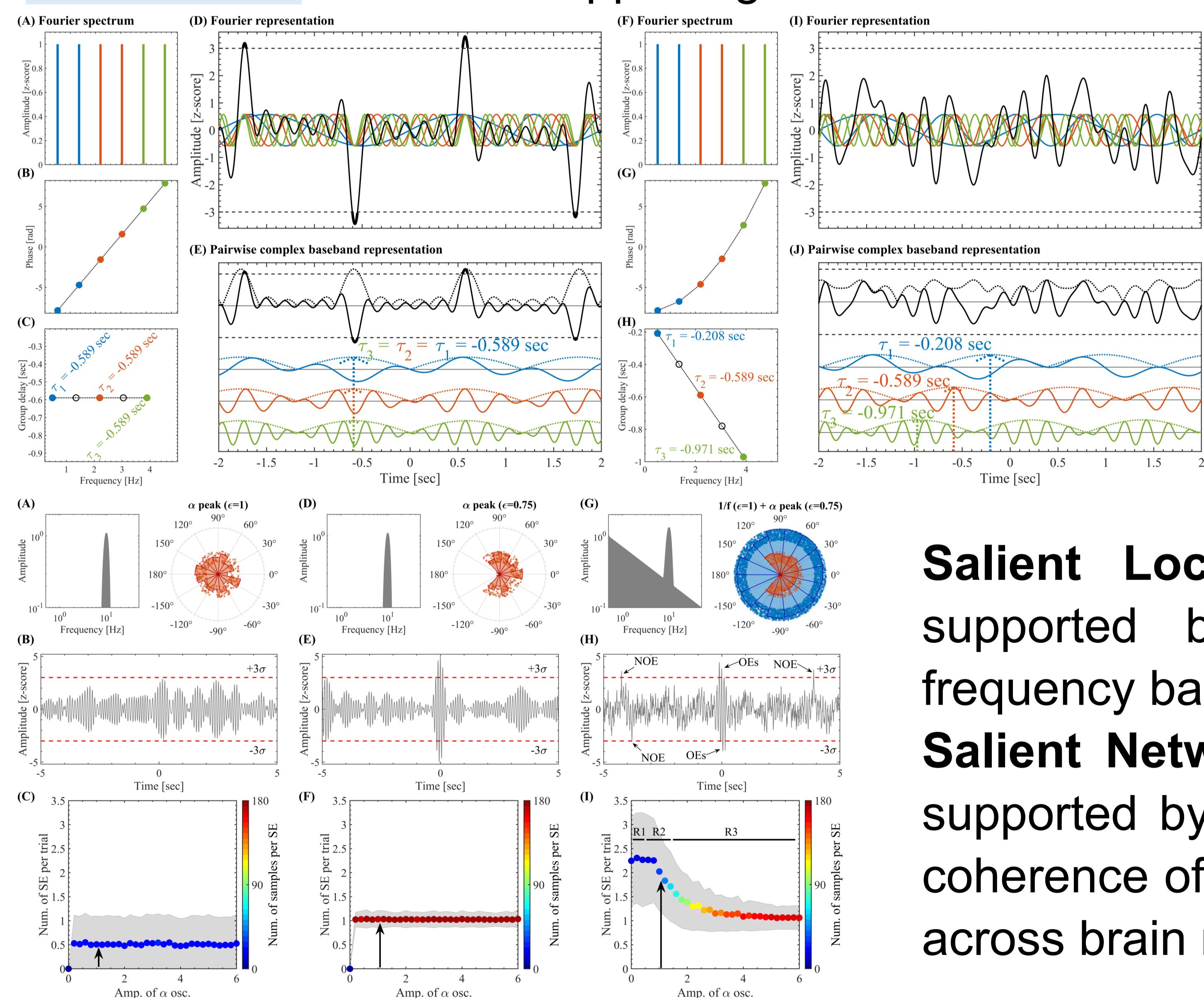
Results: Features of the observed NAs



Takeaways:

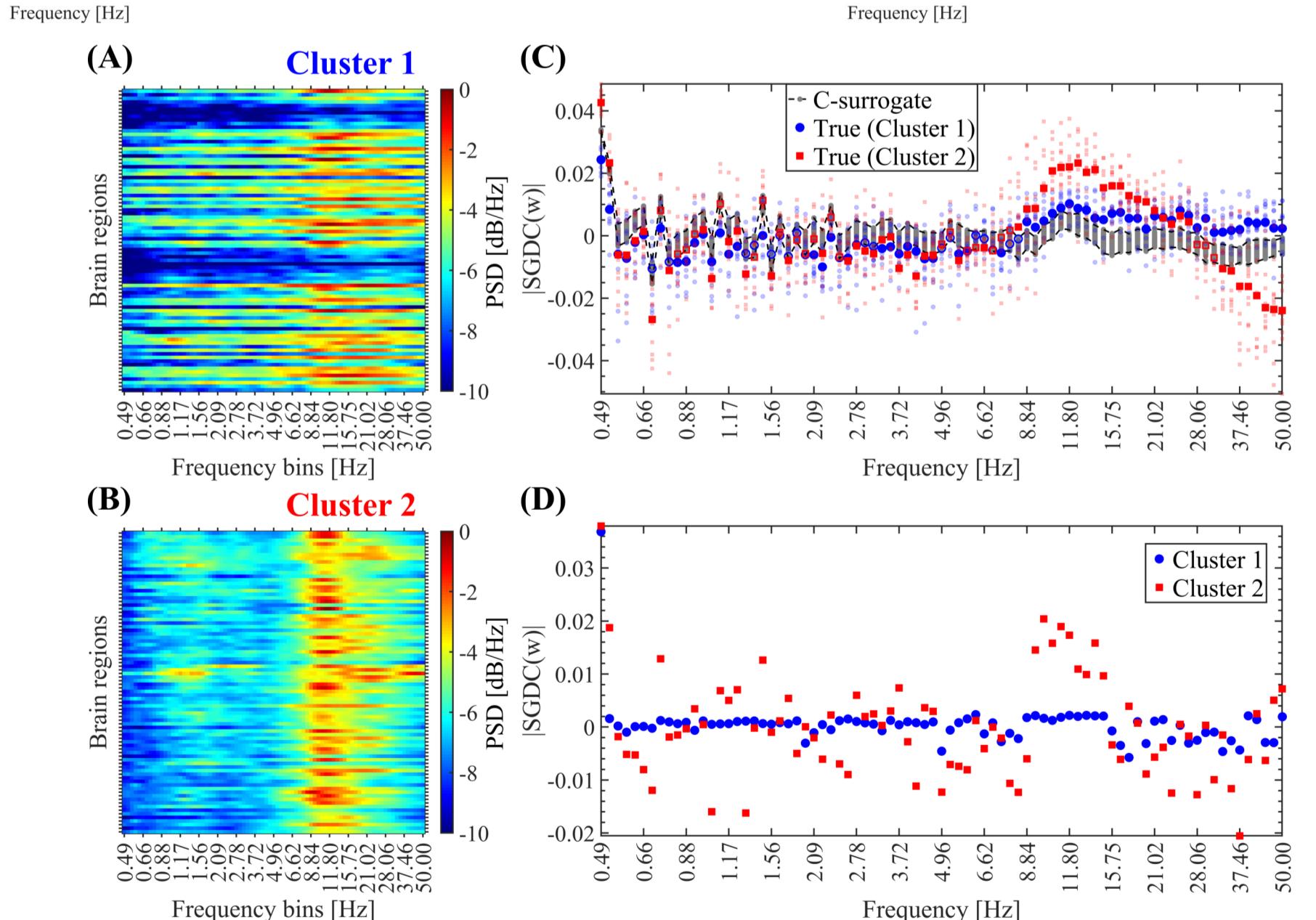
- Spectral Group Delay Consistency (SGDC), transient cross-regional coherent oscillations and broadband 1/f activity, are all key ingredients for the emergence of realistic NAs.
- Observed NAs can be segregated based on their spectral signature in two main groups having different propagation patterns.
- Large-scale spreading of alpha bursts occurs mainly via NAs, which may play a functional role as a long-range interaction mechanism in the resting human brain.

Discussion: Rationale supporting the features of the observed NAs



Salient Local Events (SLE) are supported by the SGDC across frequency bands: SGDC(ω).

Salient Network Events (SNE) are supported by SGDC(ω) and transient coherence of narrowband oscillations across brain regions: SGDC(ω).



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