

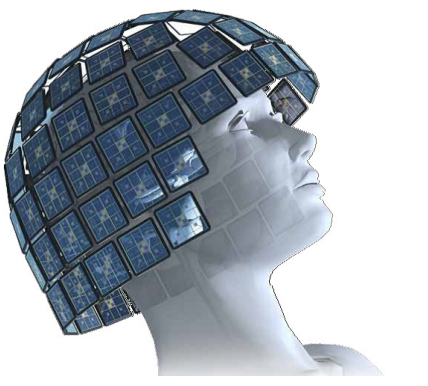
Linking neuronal avalanches with oscillatory and broadband 1/f activities in the resting human brain



Damián Dellavale,
Emahnuel Troisi Lopez, Antonella Romano,
Giovanni Rabuffo, Pierpaolo Sorrentino

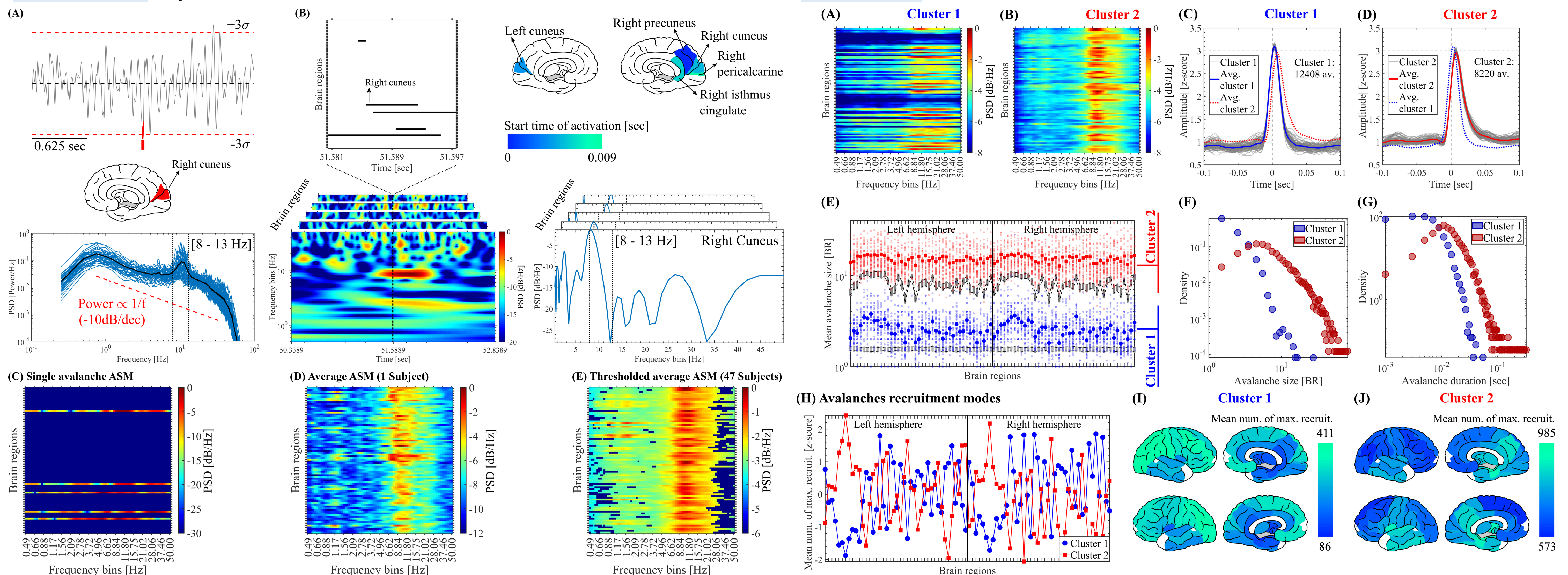


Intro: We analyzed source-reconstructed MEG data from 47 subjects. Neuronal Avalanches (NAs) were characterized as salient network events without implying a connection to the brain criticality hypothesis.



Methods: Spectral characterization of NAs

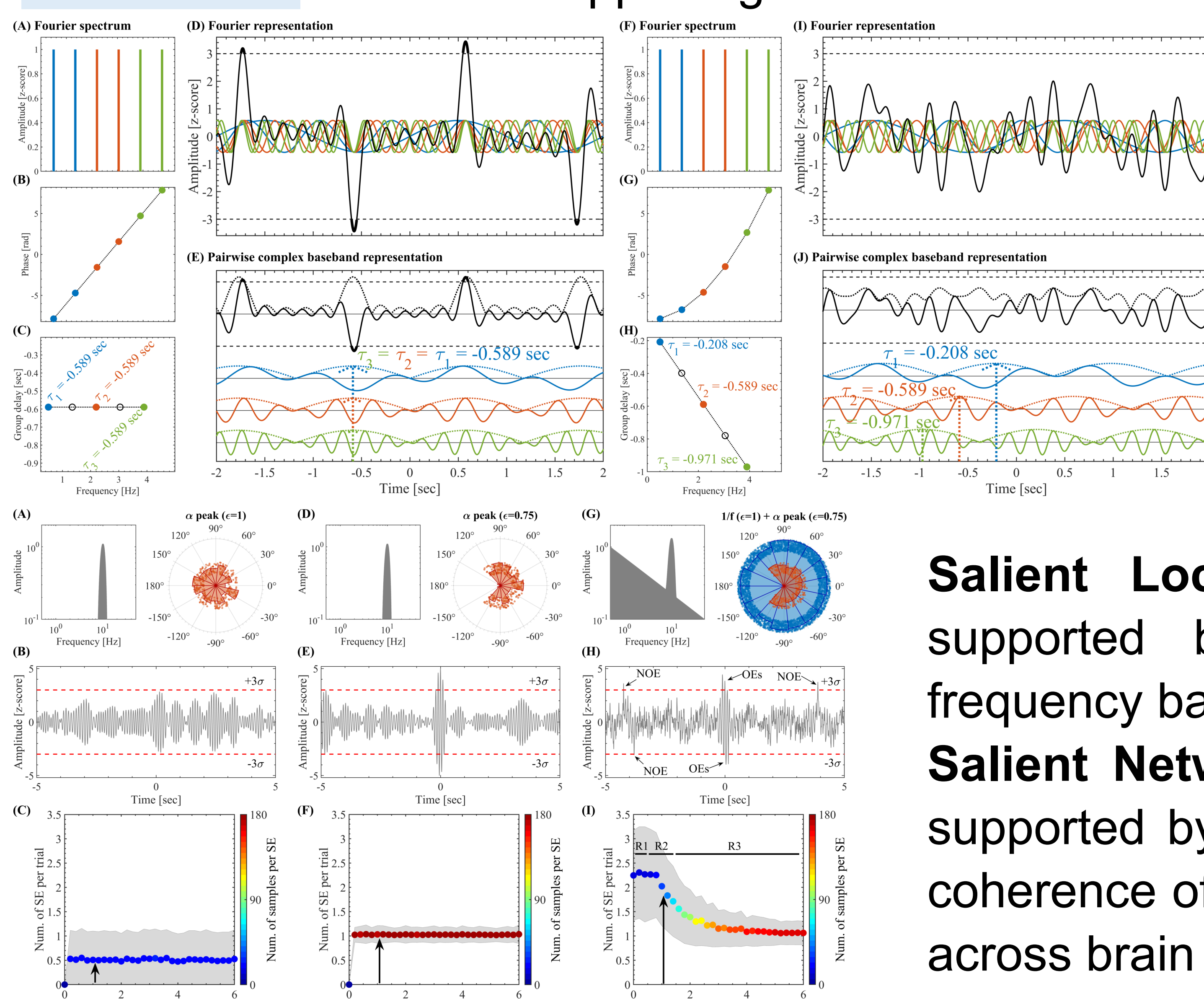
Results: Features of the observed NAs



Takeaways:

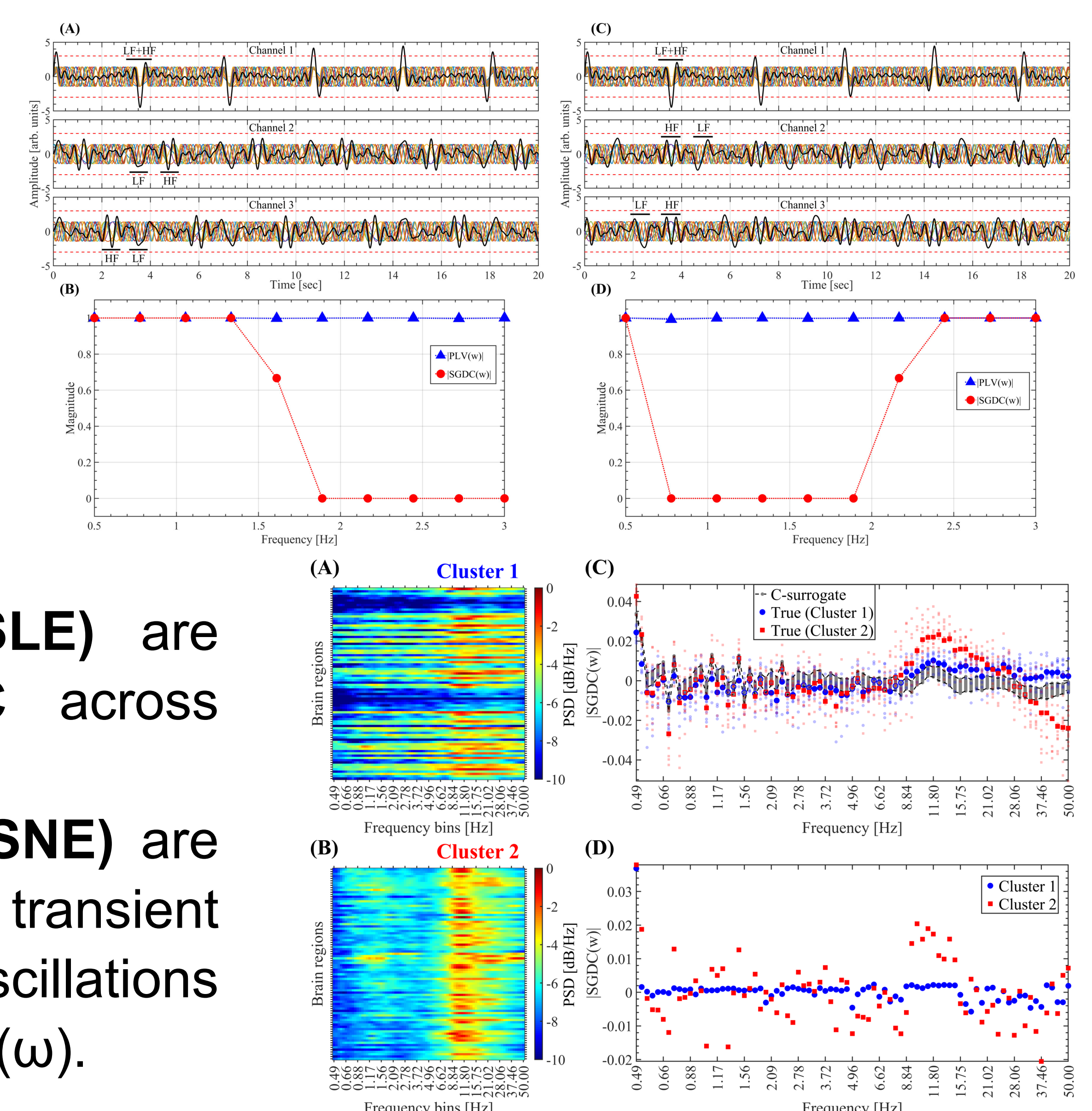
- Spectral Group Delay Consistency (SGDC), transient cross-regional coherent oscillations and broadband 1/f activity, are all key ingredients for the emergence of realistic NAs.
- Observed NAs can be segregated based on their spectral signature in two main groups having different propagation patterns.
- 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(r).

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



bioRxiv preprint:

<https://doi.org/10.1101/2024.02.28.582552>

dellavale.damian@gmail.com

<https://damian-dellavale.github.io>

39th Annual meeting of the Sociedad Argentina de Investigación en Neurociencias, SAN2024, 25th - 27th October 2024, Universidad de Buenos Aires, Argentina.

