

Decoding the brain's symphony: Oscillations, broadband activity, and paroxysmal salient events in the human encephalographic activity

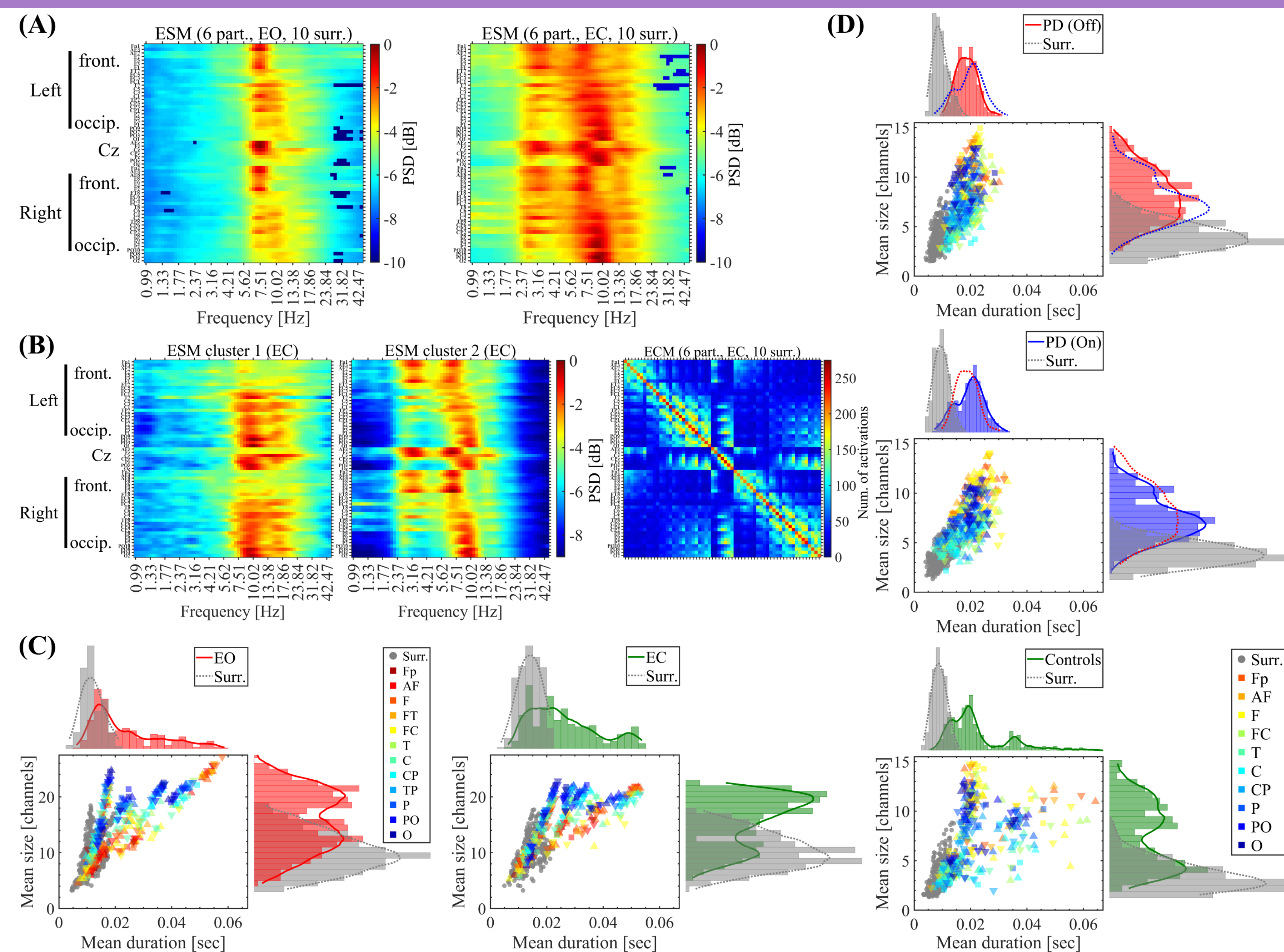
Sunday-1054



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We combined signal processing and analytical tools to reveal how transient phase-structured oscillatory (alpha) bursts contribute to long-range coordination during rest. Our analysis extends the communication-through-coherence hypothesis to the transient domain, and show the relevance of avalanche-like events in distinguishing physiological and pathological brain states.



CAPTION

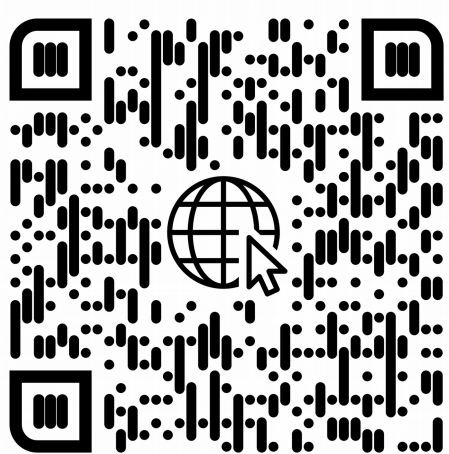
Statistical, spatiotemporal and spectral properties of Salient Events (SEs). (A) Average Event Spectral Matrix (ESM) reveals distinct spectral signatures associated with SEs observed in sensor-level EEG recordings during Eyes-Open (EO) and Eyes-Closed (EC) conditions in healthy participants during resting state (N=6). (B) The observed SEs can be segregated based on their spectral signature in two clusters disclosing different propagation patterns. (C) Similar mean SEs size and duration associated with each EEG channel was observed in EO and EC of healthy controls (N=6). (D) The mean SEs size and duration associated with each EEG channel is a biomarker distinguishing parkinsonian patients (PD) from matched controls (N=15).

REFERENCES

Dellavale D, Troisi Lopez E, Romano A, Rabuffo G, Sorrentino P (2026), Linking local and large-scale salient events with oscillatory and broadband arrhythmic activities in the resting human brain, Imaging Neuroscience (Cambridge), 4:IMAG.a.1193. DOI: 10.1162/IMAG.a.1193

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