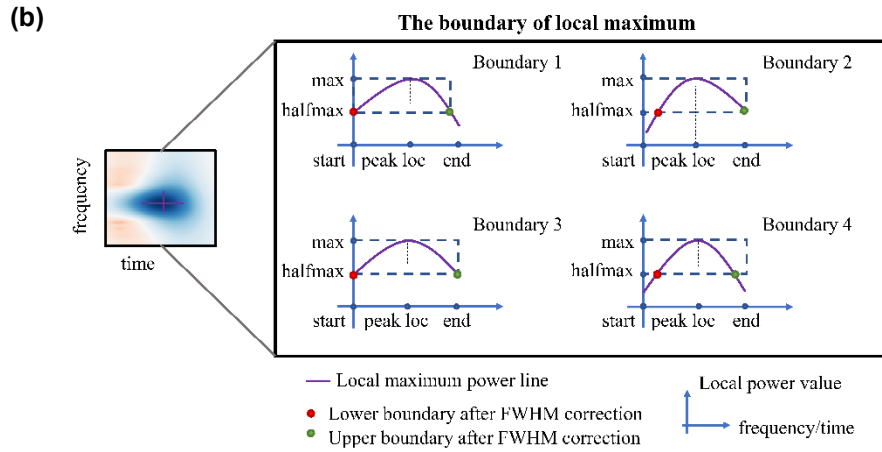
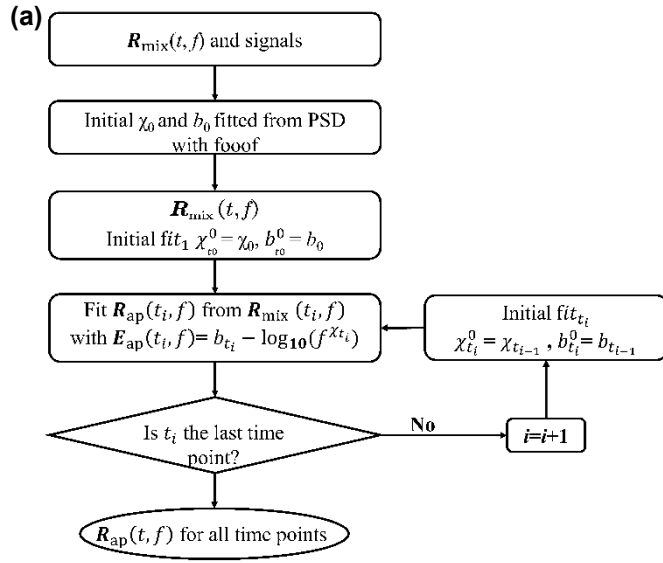


Appendix

Table S1 The paremeters of simulated data.

Peak frequency (Hz)	bandwidth (Hz)	onset time(s)	duration(s)
3	1	0.2	0.8
12	2	0.5	0.6
22	3	1.0	0.5
32	4	1.5	0.3



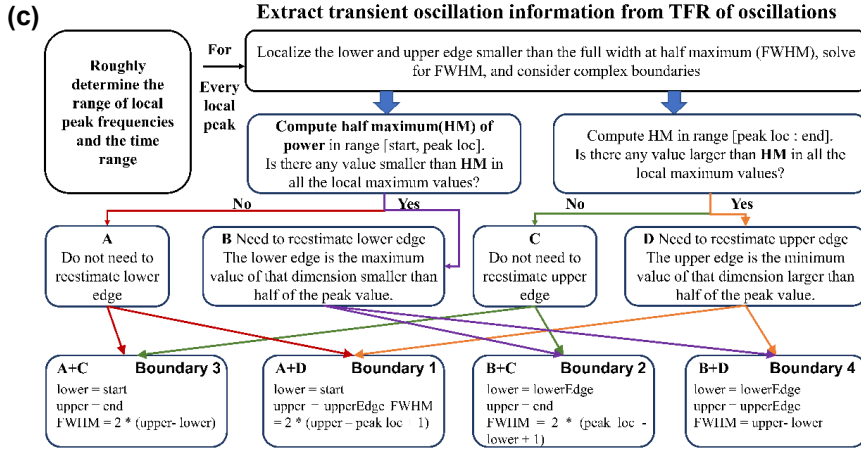


Figure S1. The algorithm of STPPTO including separating aperiodic component(a) and computing the time-frequency boundary of transient oscillation based on local maximum (b and c).

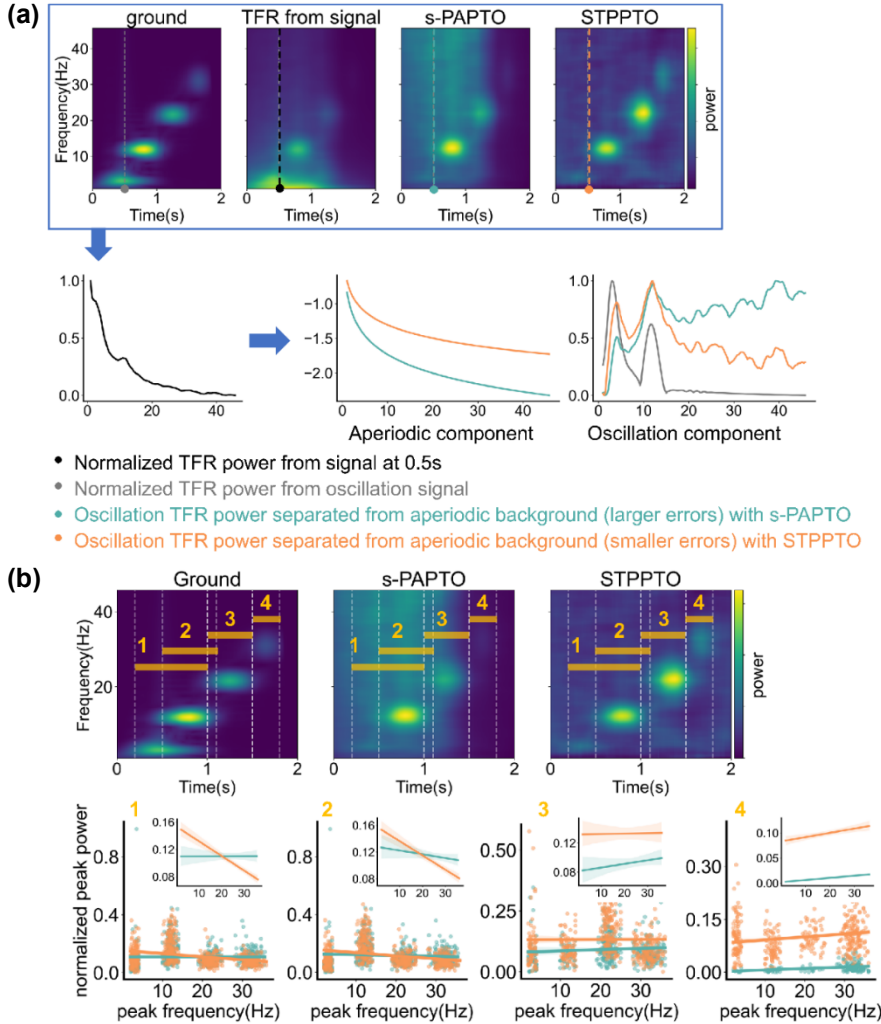


Figure S2. The oscillation power separate from aperiodic background with different method(errors). a. The oscillation power at 0.5s of ground oscillation TFR, mix TFR, oscillation TFR based on s-papto and STPPTO (in Simulation I). d. The relationship between peak frequency and normalized peak power of oscillation TFR based on s-papto and STPPTO at different peroids (in Simulation I).

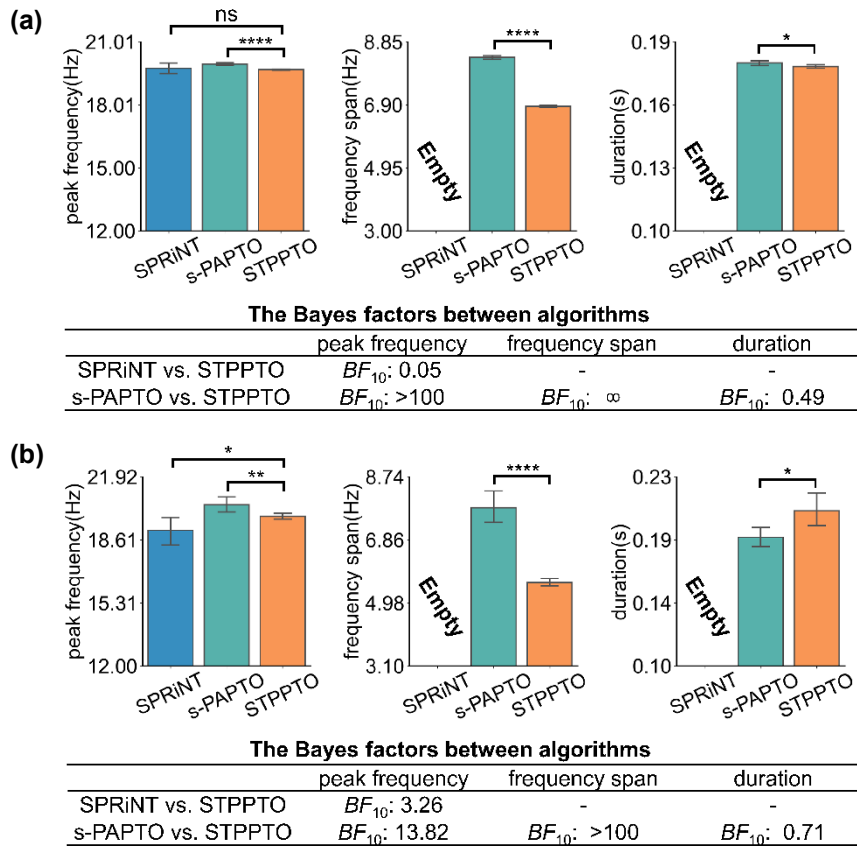


Figure S3. The result of transient alpha oscillations of primary visual cortex in resting-state SQUID-MEG(a) and OPM-MEG(b). Top panel: the mean bar charts of transient alpha oscillation peak frequency, frequency span and duration with SPRiNT, s-PAPTO and STPPTO. Error bars represent 95% C.I. for all transient oscillations of all subjects. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, ns $p > 0.05$. Bottom panel: Bayes factor quantifying peak frequency, frequency span and duration of STPPTO compared to those of SPRiNT, s-PAPTO.