

Unraveling the spatiotemporal brain dynamics during a simulated reach-to-eat task

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Supplementary Material

Supplementary Figures S1-S9

Videos 1-2

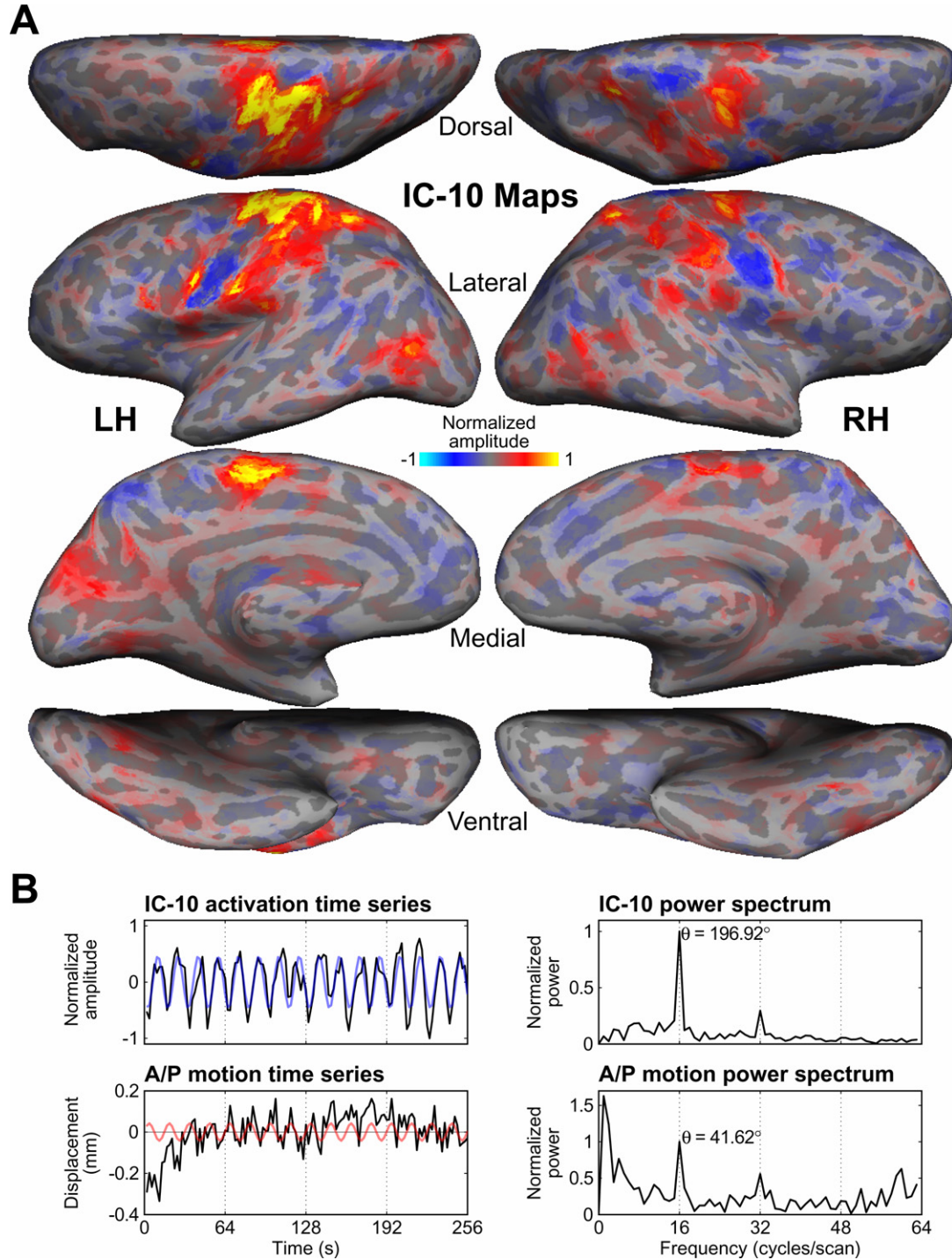


Figure S1. IC activation maps, time series, and power spectrum. (A) Activation maps of IC-10 (Subject 1, Scan 1). (B) Upper left panel: IC-10 activation time series (black curve) overlaid with a 16-cps waveform (light blue curve) reconstructed from the power spectrum (upper right panel). Lower left panel: time series of anterior-posterior motion (black curve) overlaid with a 16-cps waveform (light red curve) reconstructed from the power spectrum (lower right panel). θ : unadjusted phase angle of each 16-cps component.

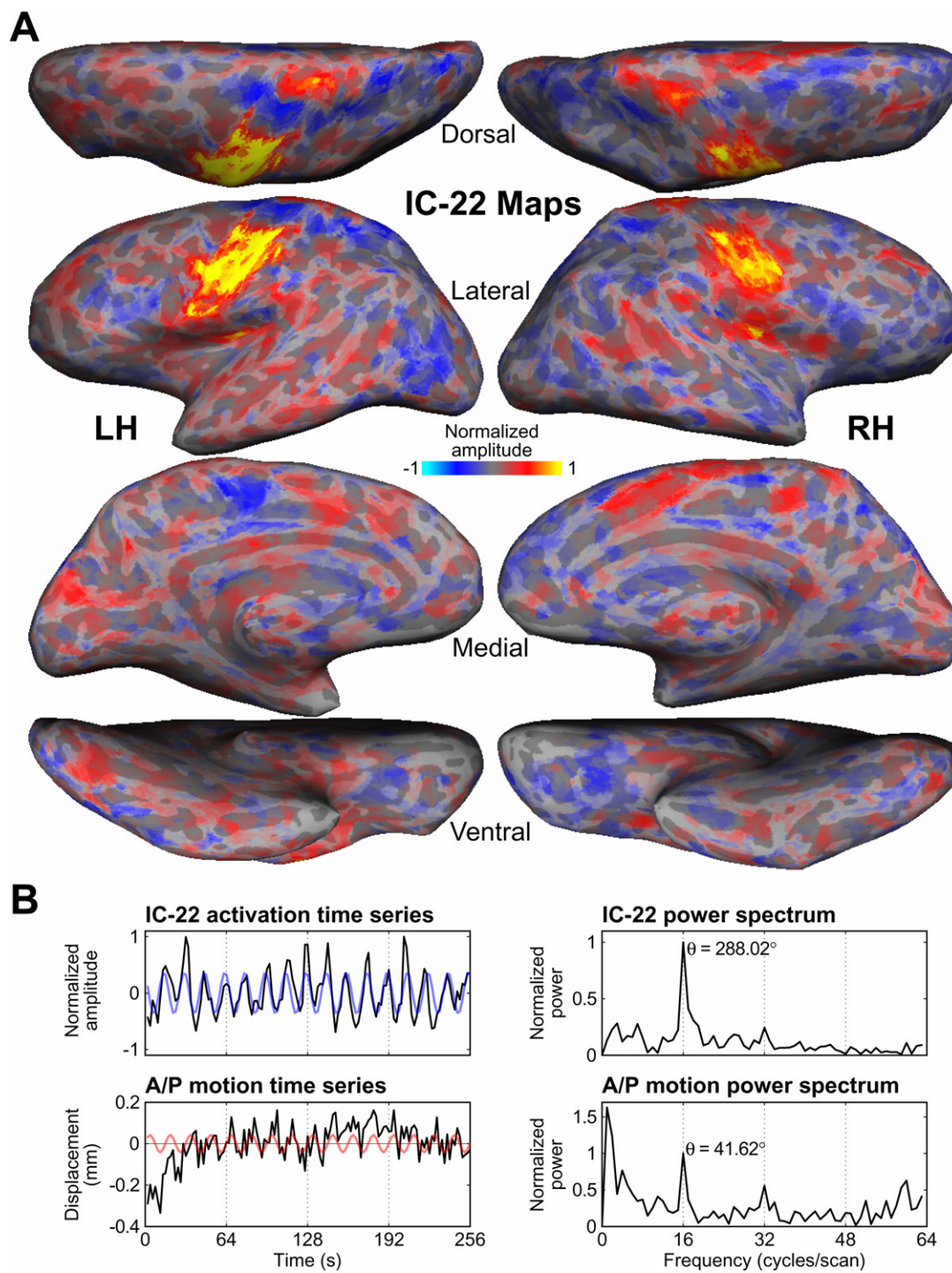


Figure S2. IC activation maps, time series, and power spectrum (Subject 1, Scan 1, IC-22). All conventions follow [Fig. S1](#).

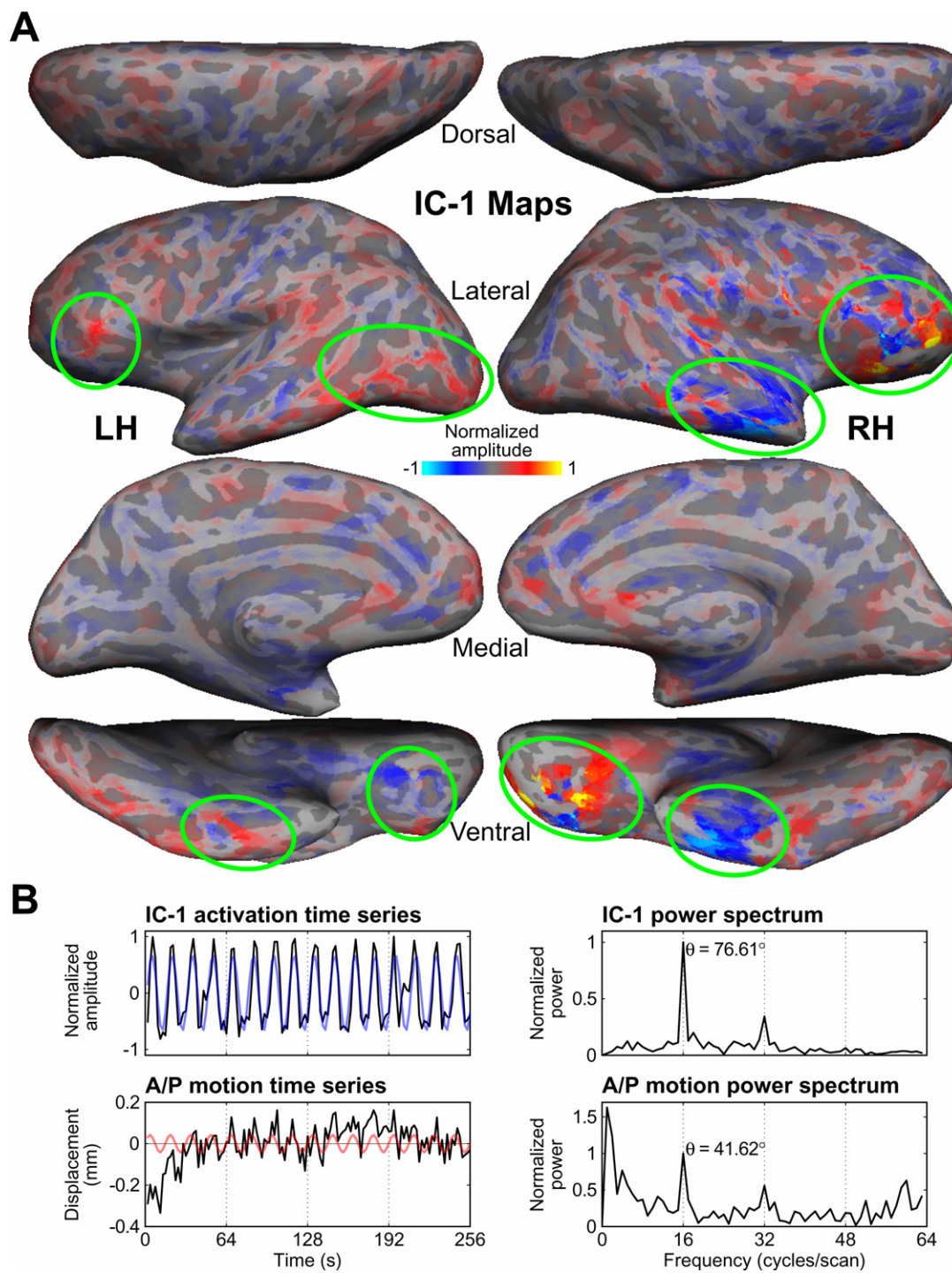


Figure S3. IC activation maps, time series, and power spectrum (Subject 1, Scan 1, IC-1). Green circles in (A): major motion artifacts. Other conventions follow Fig. S1.

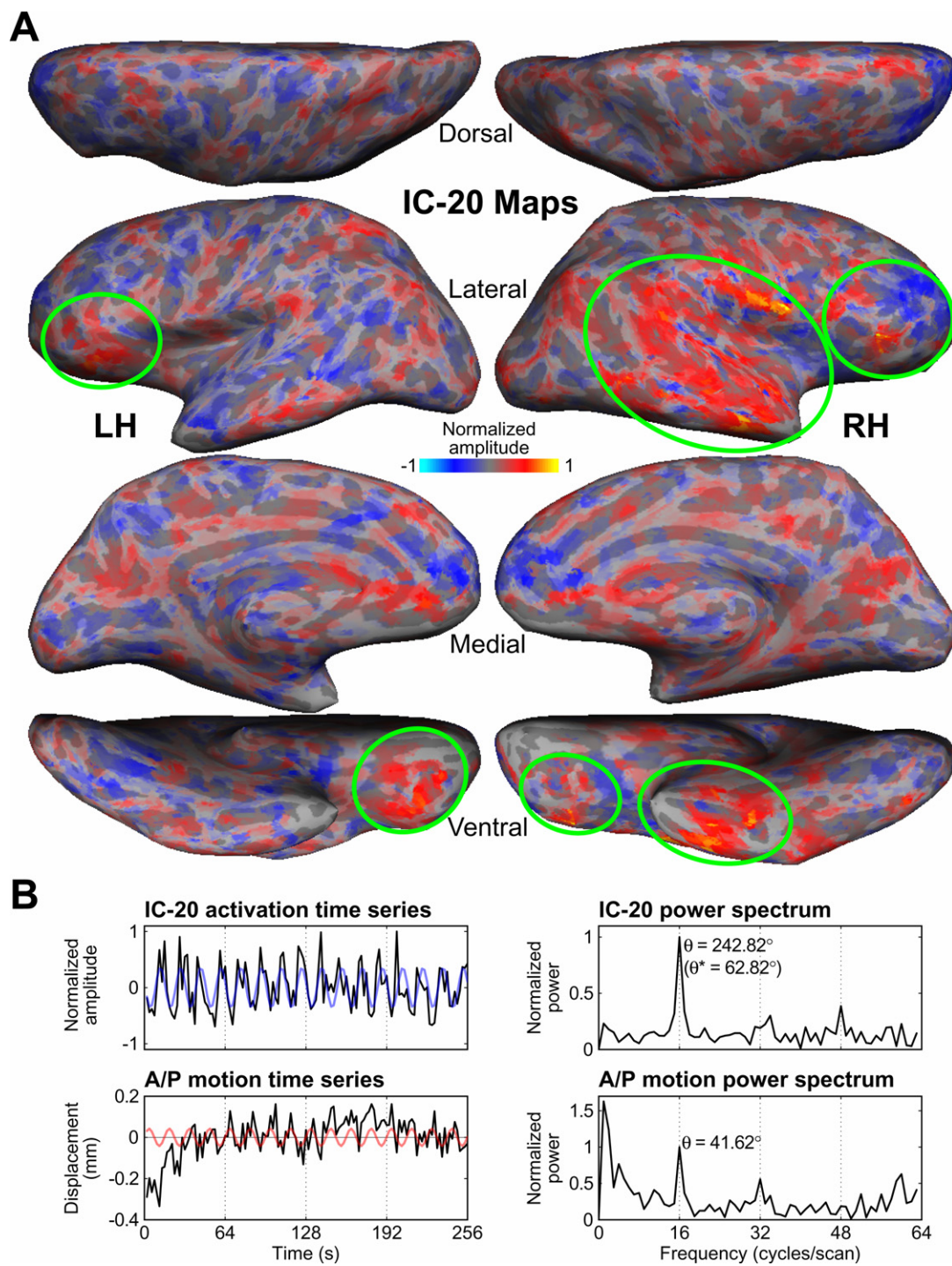
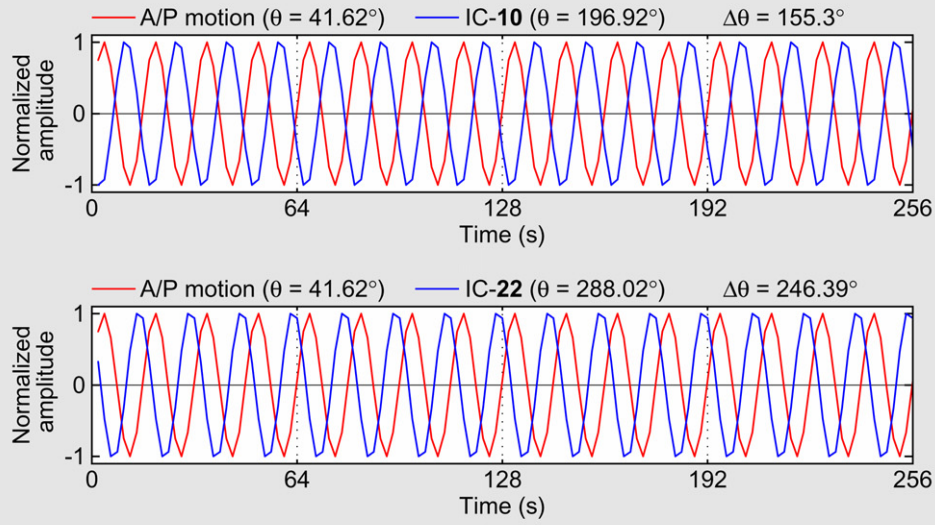


Figure S4. IC activation maps, time series, and power spectrum (Subject 1, Scan 1, IC-20). θ^* : shifting the phase angle θ by -180° . Other conventions follow Fig. S3.

Brain activations



Artifacts

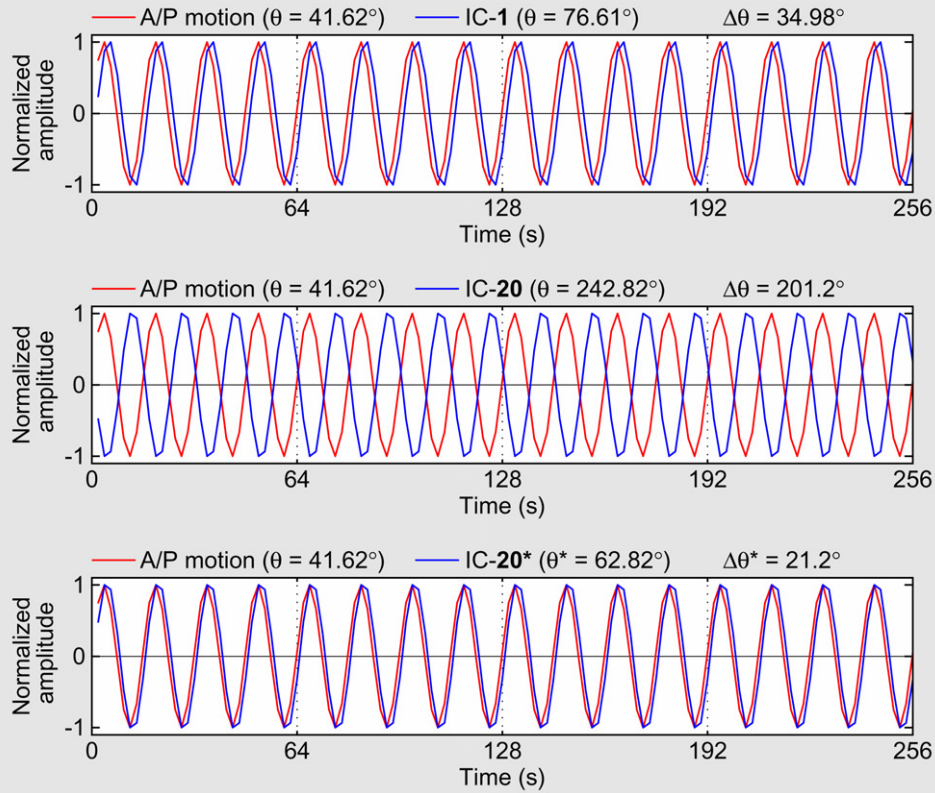


Figure S5. Comparing phase angles of the 16-cps components between ICs. See Figs. S1-S4 for IC activation time series and the A/P motion time series. $\Delta\theta$: difference between phase angles. *: phase reversal or a 180° shift in the 16-cps periodic component of the IC-20 time series.

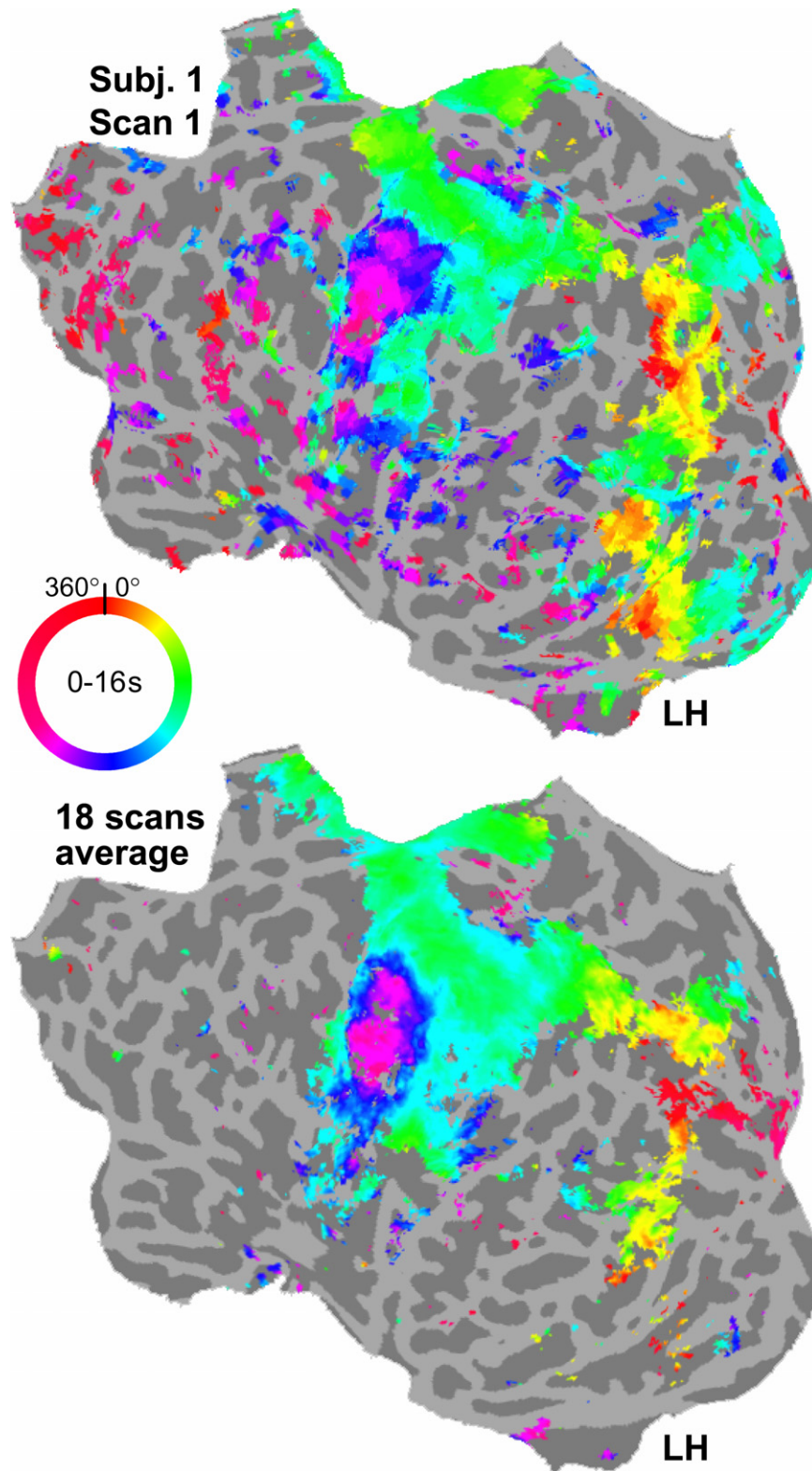


Figure S6. Maps of mean phase angle rendered on flattened cortical surfaces. Top: map of Subject 1, Scan1; Bottom: inter-scan average map.

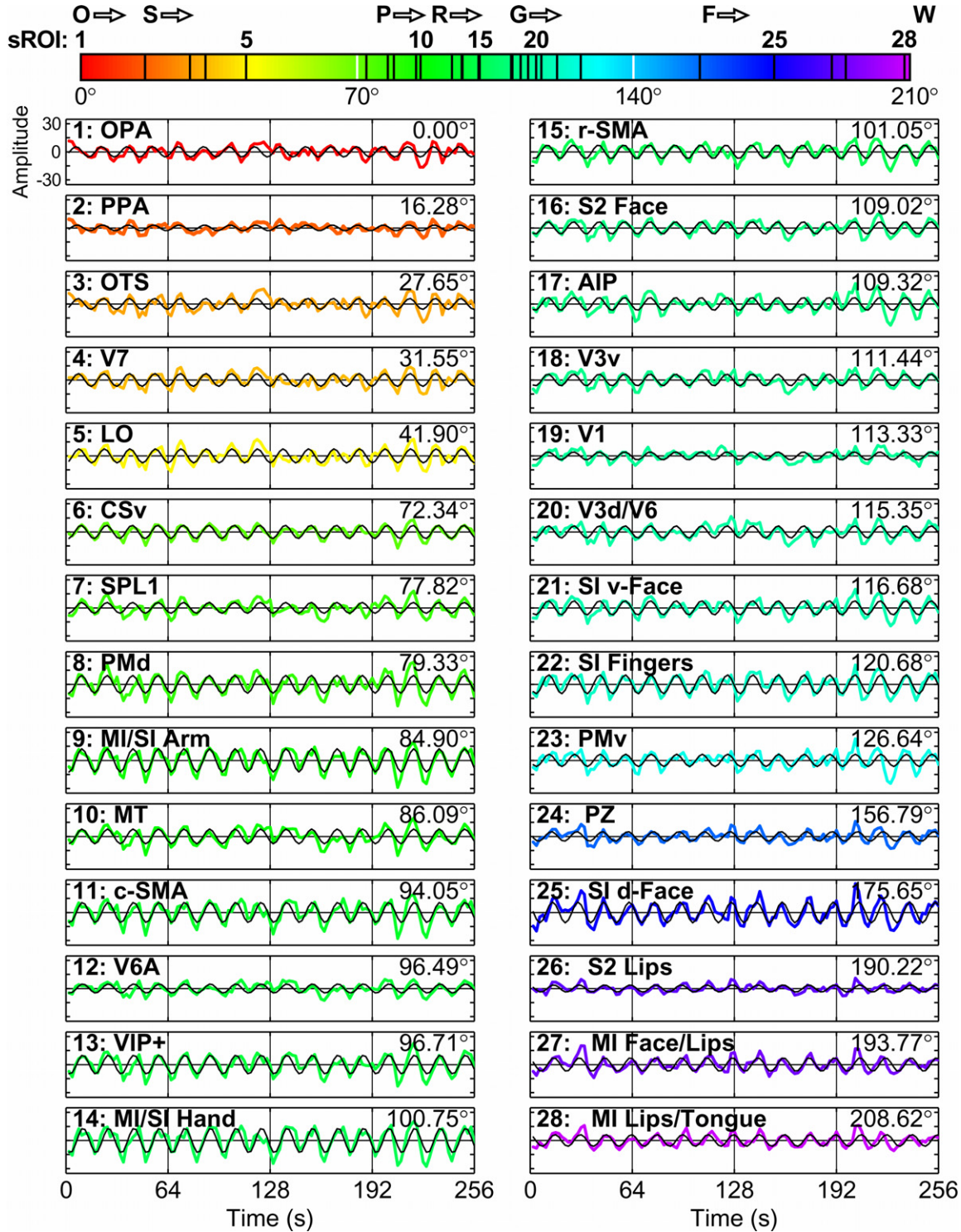


Figure S7. Average time series and mean phase angle in each sROI. See Fig. 6 for the location and label of each sROI. The mean phase angle of the average time series in each sROI was estimated by circular statistics. The 16-cps periodic component (black curve) was reconstructed from the power spectrum of the average time series of each sROI. Abbreviations: O, onset of stimulus; S, stimulus related activations; P, planning; R, reaching; G, grasping; F, feeding; W, waiting (rest).

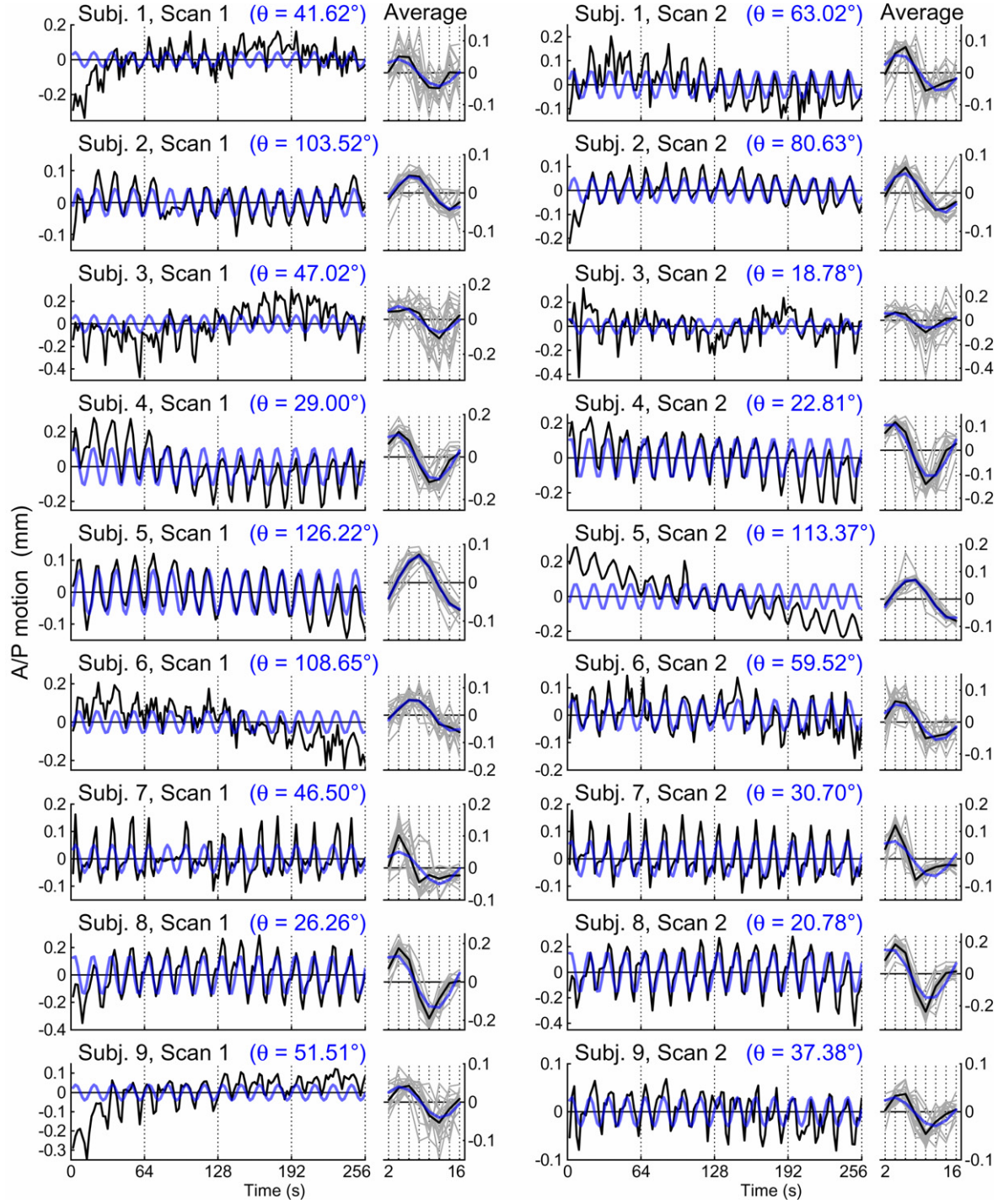


Figure S8. Anterior-posterior motion time series in all scans. The first and third columns: The 16-cps periodic component (light blue curve; modeled as $\cos(t - \theta)$) was reconstructed from the power spectrum of each A/P motion time series (black curve). The second and fourth columns: 16-s (8 TR) epochs of the A/P motion time series (gray curves) overlaid with the average waveform (black curve) and the 16-cps periodic component (light blue curve) within a cycle. All 256-s curves and 16-s epochs have zero mean.

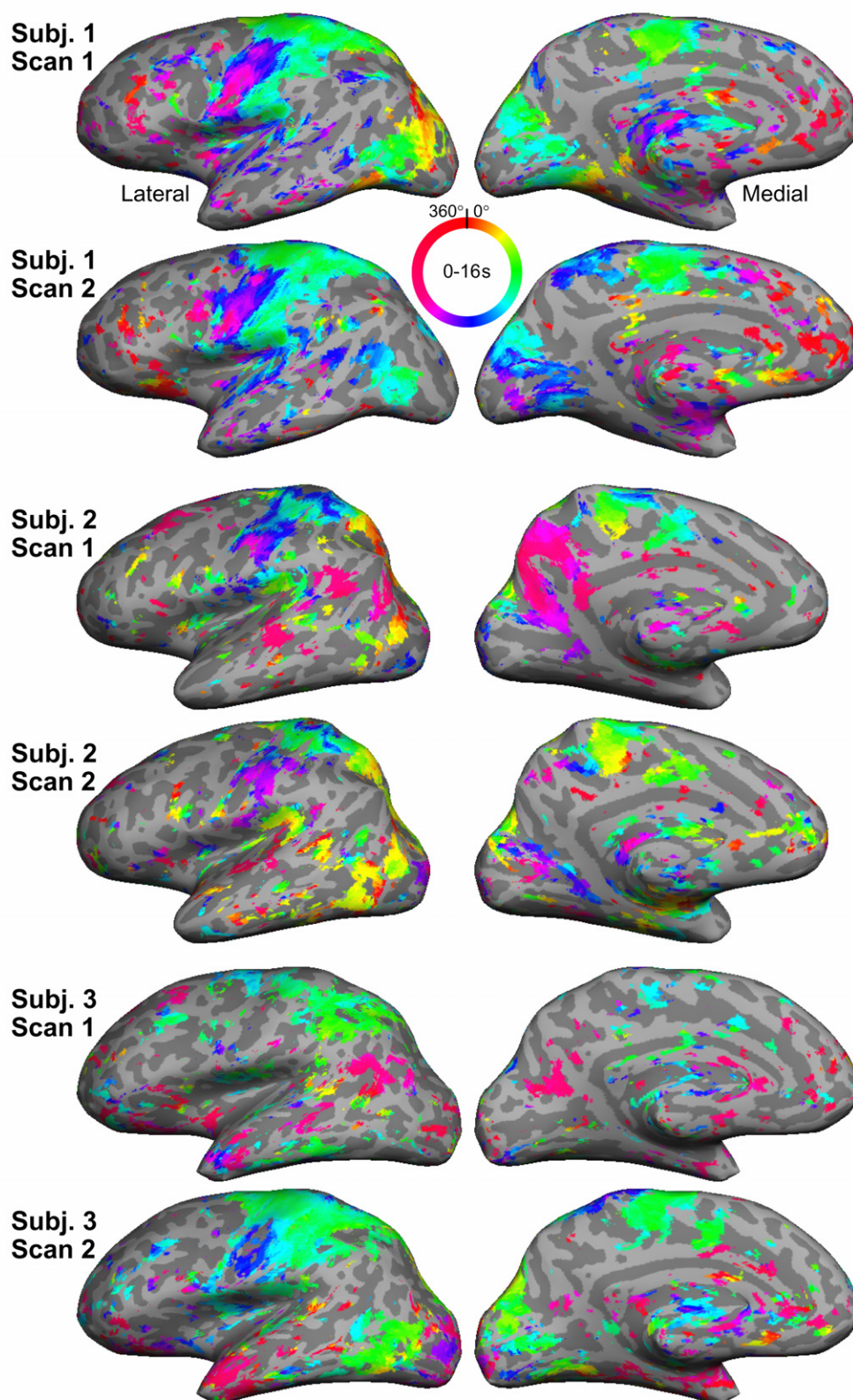


Figure S9. Single-subject maps of mean phase angle (Subjects 1-3). All conventions follow Fig. 4.

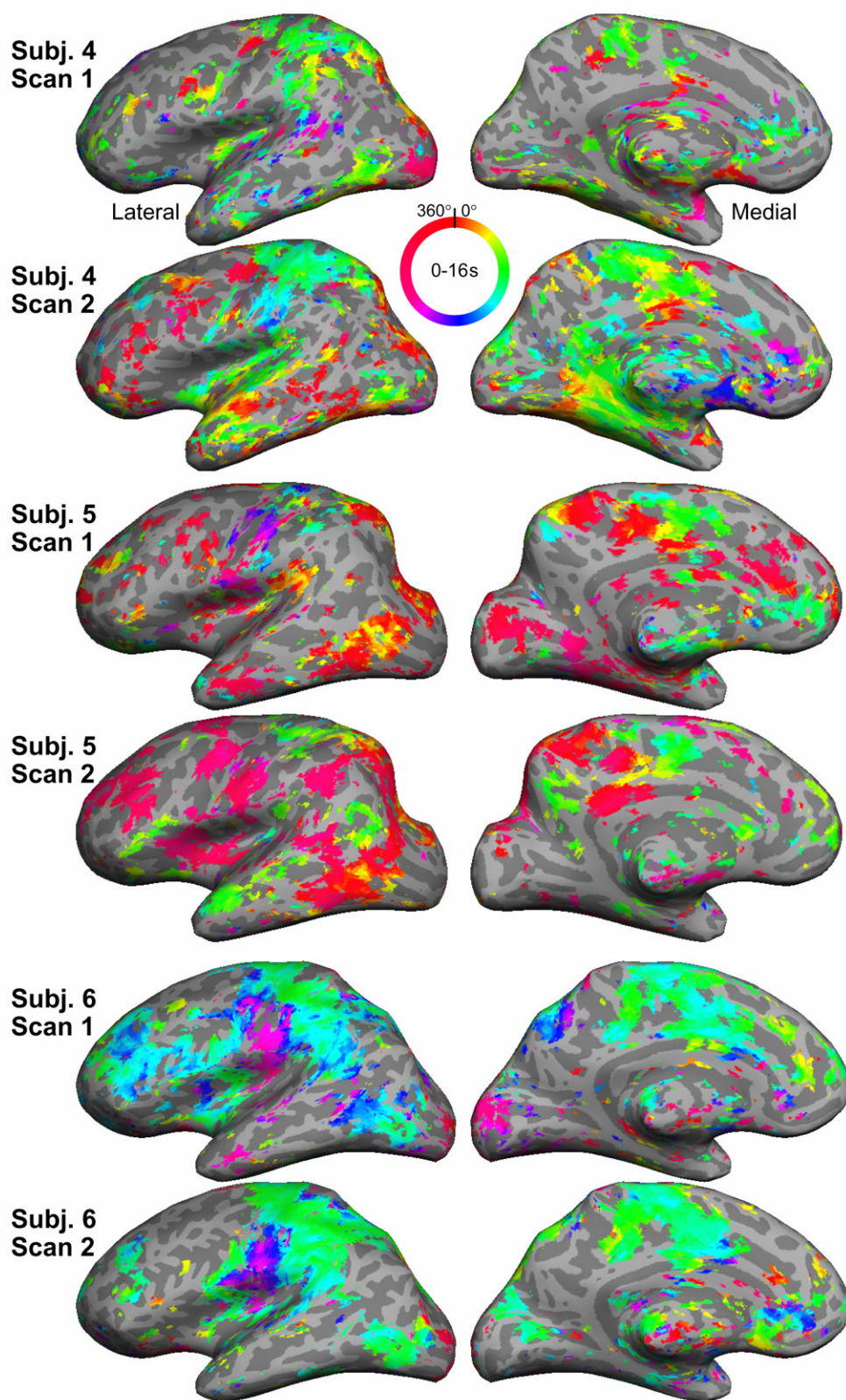


Figure S9. Single-subject maps of mean phase angle (Subjects 4-6).

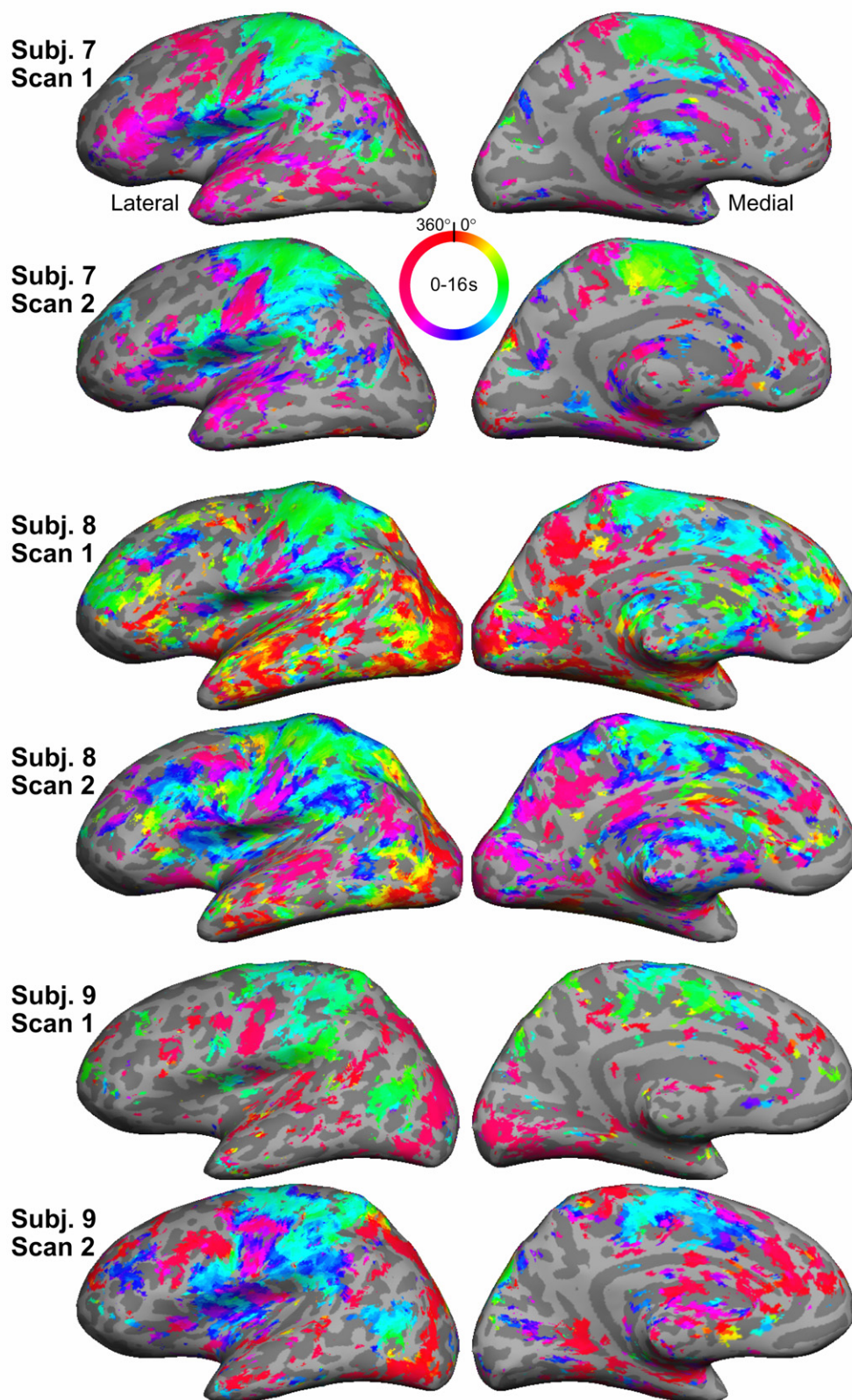
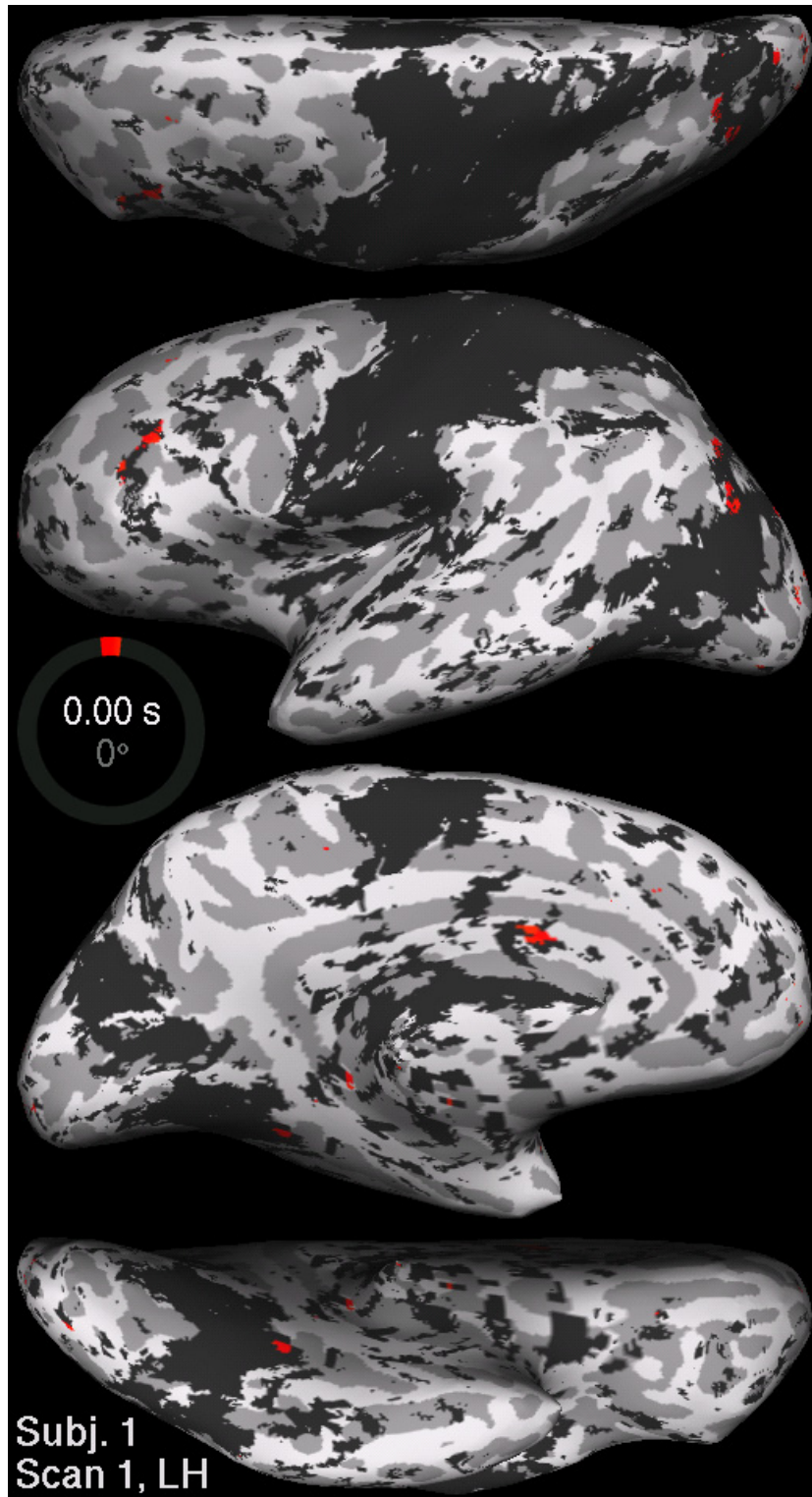
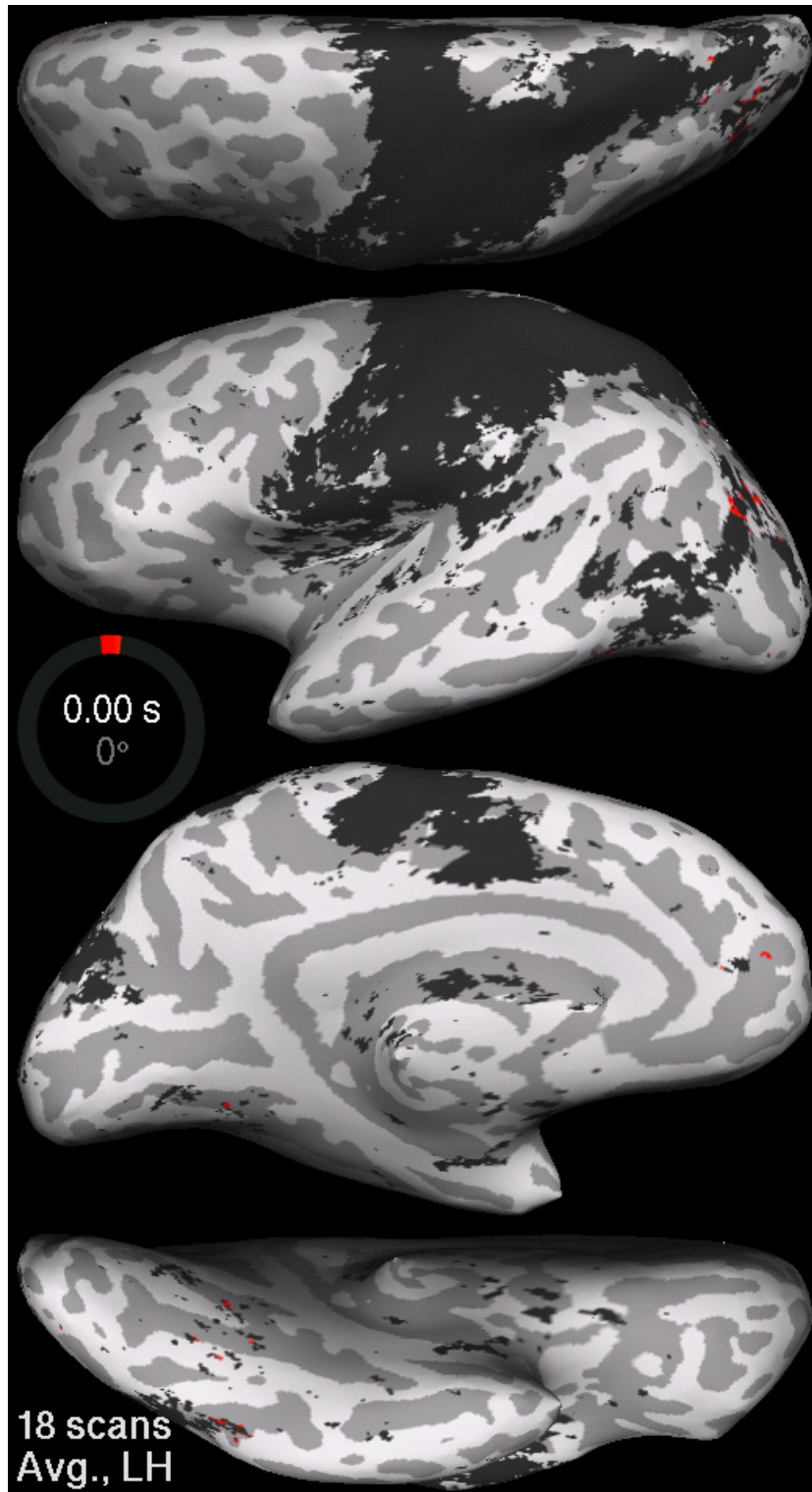


Figure S9. Single-subject maps of mean phase angle (Subjects 7-9).



Video 1. A movie showing iso-phase contours traveling over the cortical surface in a single-subject map. The movie was rendered with 120 frames for a 16-s cycle (360°) based on the map of mean phase angle of Subject 1, Scan 1 (Fig. 4). Each frame shows brain activations with mean phase angles within a range of $\pm 6^\circ$ centered at $0^\circ, 3^\circ, 6^\circ, \dots, 357^\circ$.



Video 2. A movie showing iso-phase contours traveling over the cortical surface in the inter-scan average map. The movie was rendered based on the inter-scan average map of mean phase angle (Fig. 8). All conventions follow Video 1.