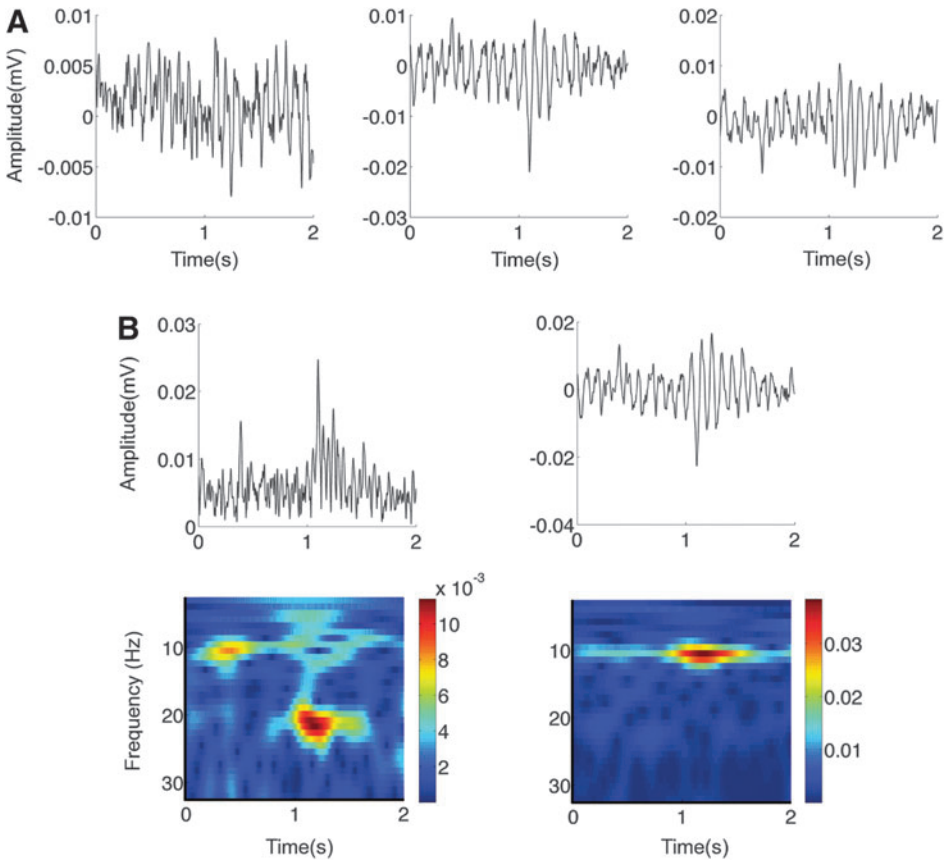
Supplementary Data

Dimension Reduction of the Source Vectors

Each source vector or dipole estimated by LORETA is a vector with three components, projected onto the *X*-, *Y*-, and *Z*-axes. To obtain a single (scalar) time series for each solution point, taking the Euclidean norm of the source vector projected onto the *X*-, *Y*-, and *Z*-axes leads to frequency doubling. That is, the discrete Fourier transform (DFT) of a source vector, x(t), is not equal to the DFT of ||x(t)||, where ||.|| is the Euclidean norm. Figure 1 illustrates this effect. The *X*-, *Y*-, and *Z*-components of a source vector in the left visual cortex reveal clear alpha activity, whereas the Euclidean norm shows spurious power at 20 Hz (frequency doubling, Fig. 1B bottom-left). In contrast, the first principal component analysis (PCA) projection correctly shows continuous power in the alpha band (Fig. 1B bottom-right). We hence applied PCA approach to each specific source vector and took the first component as the representative source time series (Hipp et al. 2012).

Reference

Hipp JF, Hawellek DJ, Corbetta M, Siegel M, Engel AK. 2012. Large-scale cortical correlation structure of spontaneous oscillatory activity. Nat Neurosci 15:884–890.



SUPPLEMENTARY FIG. S1. Dimension reduction of an exemplary visual source vector. **(A)** The *x*, *y*, and *z* components of a source vector in the occipital cortex. **(B)** The Euclidean norm (top-left) and the first principal component analysis (PCA)-projection (top-right) of the source vector, time-frequency power spectra of the Euclidean norm (bottom-left), and the first PCA-projection (bottom-right). The Euclidean norm results in frequency doubling, whereas the first PCA project correctly captures the activity in the alpha band.