







Supplementary Figure 1. Full profile of electromagnetic recordings of the same illustrative spindles as are shown in Figure 1. Please notice the greater synchrony of EEG sensors during spindles. In contrast, MEG recordings show asynchronous and sporadic activity. The duration of recordings is 12s.

Supplementary Figure 2. Recording of a single spindle from EEG (**A**) and MEG (**B**) sensors. A1. Superimposed referential EEG waveforms from 60 scalp channels during a single spindle. A2. The same data in a time-intensity plot, where peaks and troughs, normalized to the largest channel, are synchronous across the scalp. The EEG peaks, marked with vertical lines, have no regular relationship to the peaks of simultaneously recorded MEG spindles from 204 gradiometers (B). This example is from subject 5.

Supplementary Figure 3. *Spatiotemporal complexity in each modality evaluated with Principal Component Analysis (PCA) of spindles: overlay of curves calculated for individual spindles.* As in Figure 4 of the main paper. The cumulative sum of variance explained by PCA components calculated on 85 individual spindles in 7 subjects. PCA based on gradiometers (black lines) required the largest number of components to explain the data variance, and referential EEG (magenta) the fewest. Bipolar EEG (navy blue) and magnetometer (green) gave intermediate values.