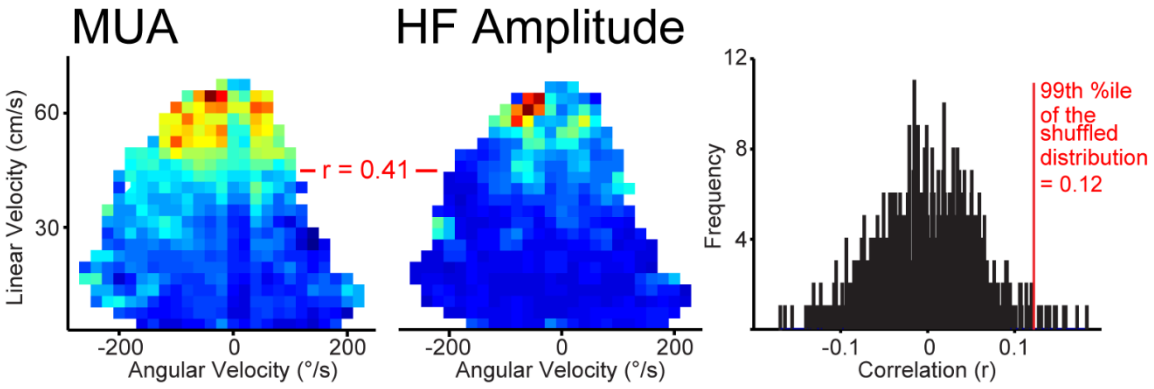

Figure S1. High frequency (HF) amplitude and multiunit acivity (MUA) maps can be highly correlated. **Related to Figure 3.** ***Left and Middle***. Same as in **Figure 3A**; however data came from the same session but from either the multiunit activity from a single tetrode (l*eft*, MUA) or from the high frequency (HF) signal recorded from a single wire of the same tetrode (*middle*, HF Amplitude). ***Right***. The shuffled distribution and critical r-value corresponding to the 99th percentile is shown. Shuffling was performed for the two self-motion maps (MUA and HF-LFP signal) as described for the two maps shown in **Figure 3A**.

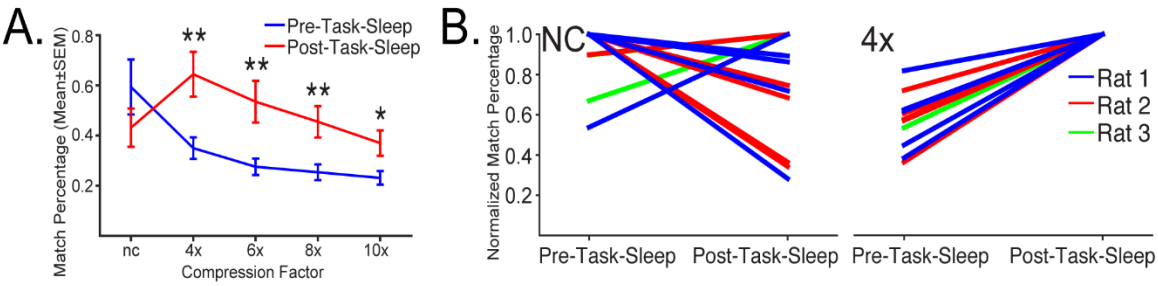

Figure S2. Modular sequence reactivation in parietal cortex. **Related to Figure 5. A.** Mean (±SEM**)** match percentage (number of matches / number of time bins) across the compression factors for high frequency (HF) amplitude templates for slow-wave sleep periods. Template matching increases between *pre-* (blue) and *post-task-sleep* (red) for compressed data, but not for 'no-compression' (nc). As with MUA, HF amplitude template reactivation measures peak at 4x compression. **B**. Normalized match percentage (number of matches / number of time bins divided by the peak value for that session) across the 'no-compression' (nc, *left*) and 4x (*right*) compression factors for high frequency (HF) amplitude templates for slow-wave-sleep periods for each session for each of 3 rats. Reactivation consistently increases between *pre-* and *post-task-sleep* for compressed data, but not for no-compression. Datapoints are normalized to *pre-task-sleep* values. * $p < 0.05$, ** $p < 0.001$.

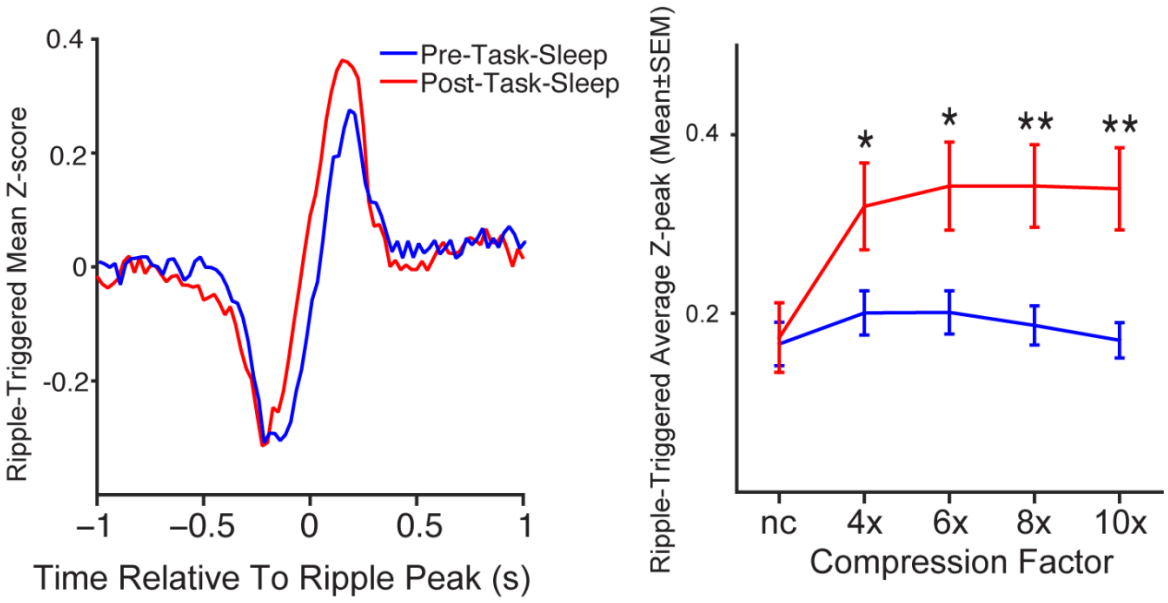

Figure S3. High frequency (HF) amplitude modular sequence reactivation in parietal cortex is enhanced during sharp-wave ripples (SWRs) in the hippocampus. Related to Figure 6. ***Left***. Example of sharp-wave ripple (SWR) triggered average Z-scores for *pre-task-sleep* (blue) and *post-task-sleep* (red) with 4x compression. SWR triggered peak amplitudes for HF amplitude templates decaying to baseline within 500ms after ripple peak. ***Right***. Ripple-triggered average peak amplitudes across the compression factors for HF amplitude templates. Peak amplitudes varied significantly across compression factors for HF amplitude templates (significant interaction between compression factor and rest session; $p < 0.0001$). Only slow-wave sleep periods were included in the analysis. *** $p<0.0001$.