**Supplementary figure S2**: Cross-correlation coefficient between action potentials (AP) of hippocampal interneurons and neocortical LFP (AP-LFP correlation). The x-axis denotes the time lag and the y-axis denotes the correlation-coefficient. Different colors represent AP-LFP correlation for different cells. Thick red line shows the population averaged AP-LFP correlation. The AP-LFP correlation was noisier than, but similar to, the MP-LFP correlation (figure 2a). It showed 0.5Hz UDS modulation and the peak of the correlation occurred at positive latencies (402.6±215.8ms), indicating that the interneurons’ spiking activity were correlated with, and phase lagged with respect to, the cortical UDS.