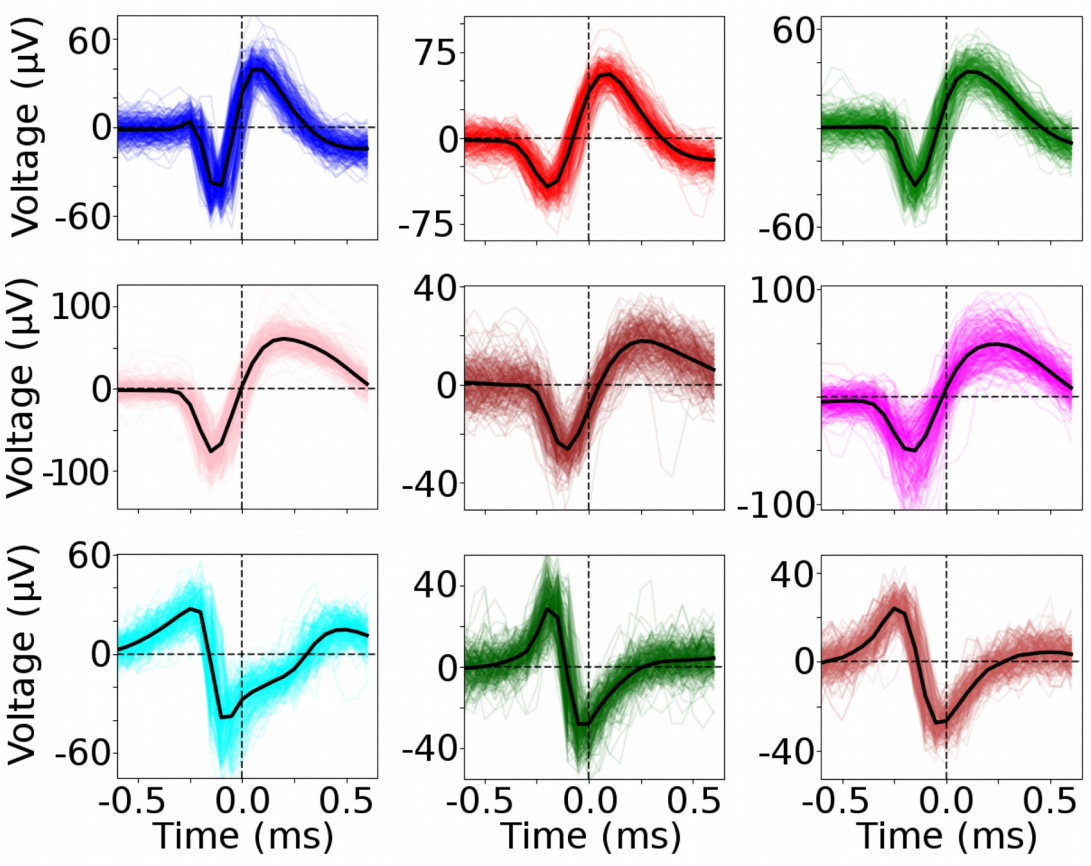

Figure 1: Examples of single unit clustered spikes. Spikes on the maximum amplitude channels for nine randomly chosen single units from cat and mouse recordings.

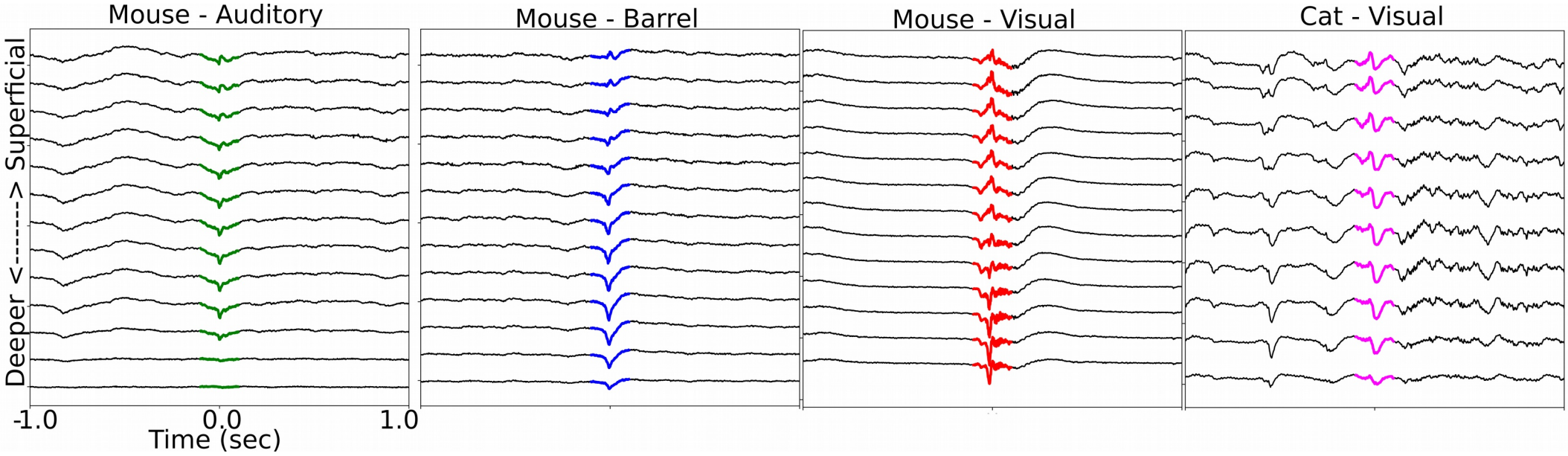

Figure 2: Examples of LFP depth-inversion near LECs. **A**. 10 channels of LFP (black traces) centred on individual LEC events (coloured traces) reveal polarity inversion in superficial vs. deeper cortical areas.

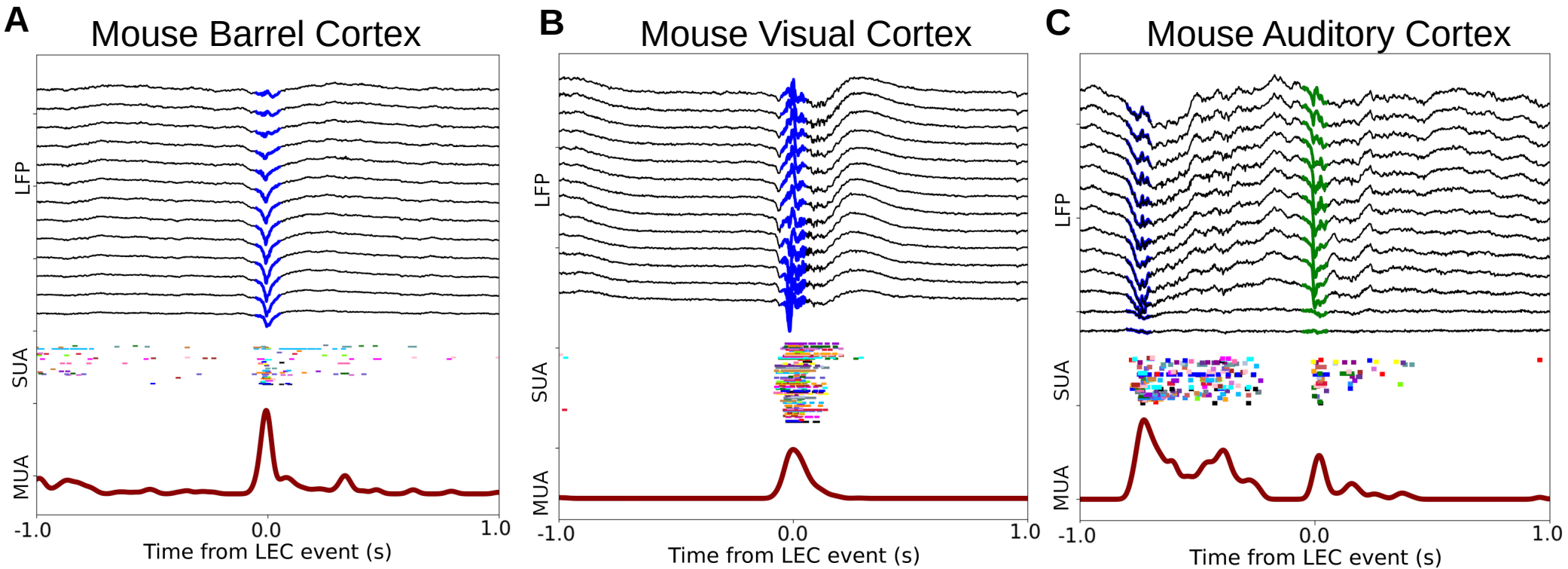

Figure 3: Example LECs - Mouse. A. Top: 2sec of LFP series (13 channels) arranged by depth overlayed with 100-ms wide LEC events (colored traces; colors indicate different LEC clusters). Middle: Single-Unit Activity SUA) rasters for neurons spike sorted during the event; Bottom: Multi-unit-activity (MUA) histogram (Note: LFP was band pass filtered: 0.1Hz-500Hz). **B, C.** Same as A. but from a recording in a different mouse and in another cortical region.

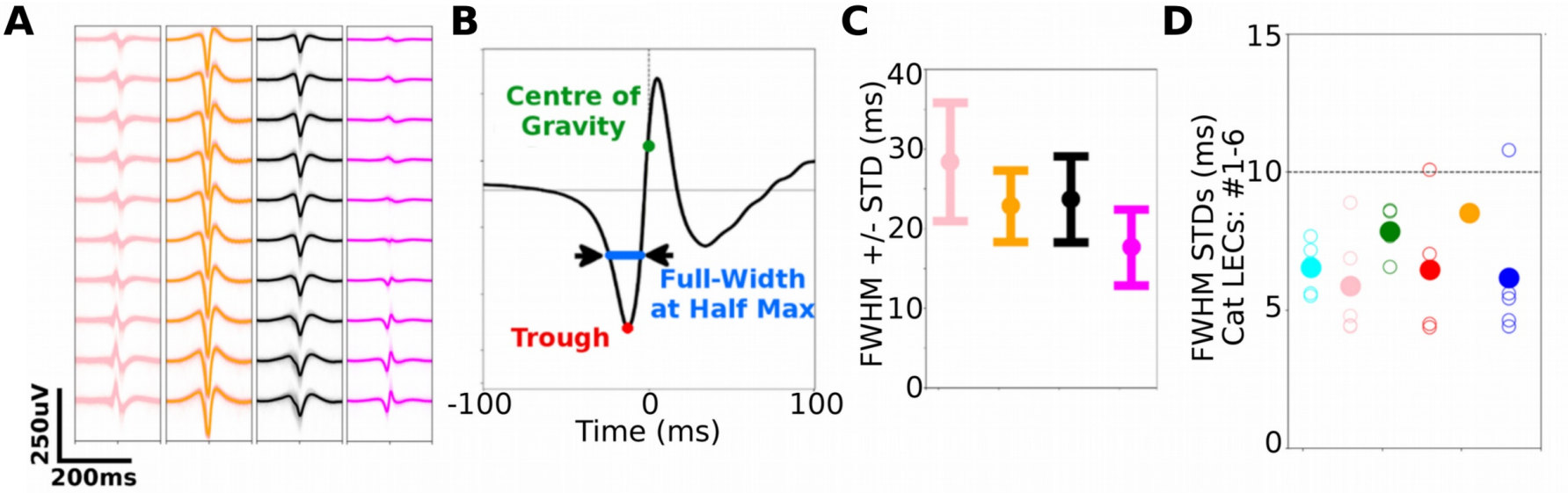

Figure 4: Alternative measures of the stability of LEC events. A. The four LEC templates shown in Fig 1G. B. measurement of the full-width-half-max (FWHM) from the first trough (i.e. negative peak) of each LEC event. C. FWHM means and standard deviation of the four LEC events shown in A reveal that most LECs FWHM standard deviations are < 10ms. D. Same as C but for all 24 recordings in Figure 2.

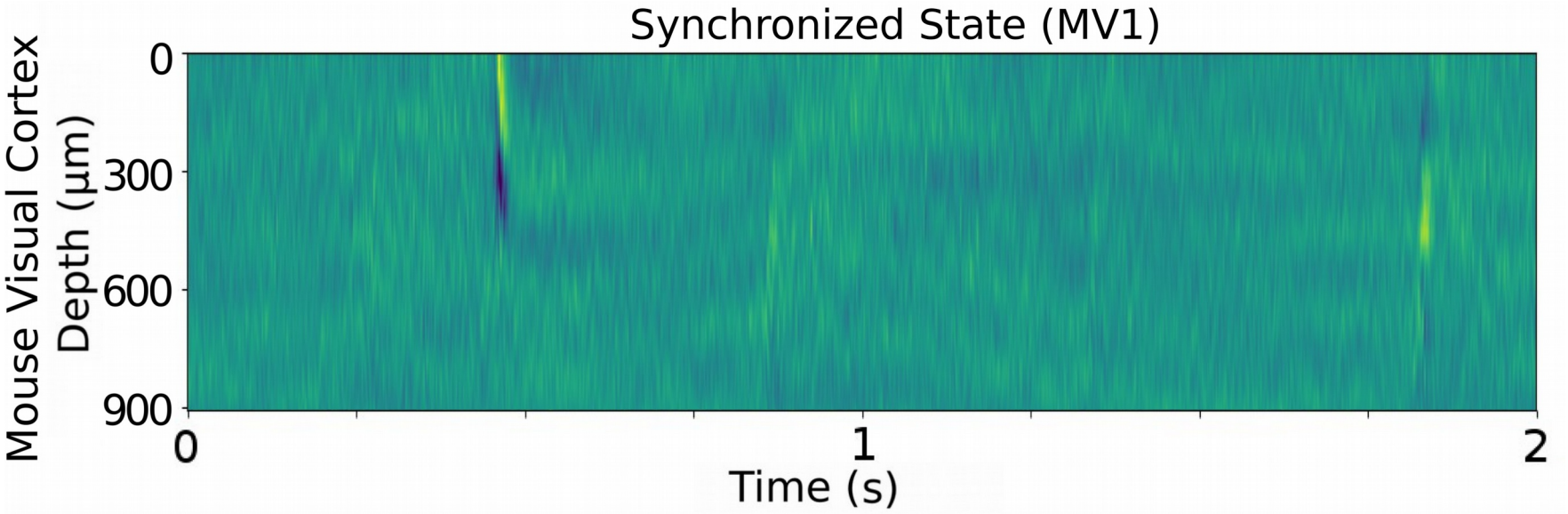

Figure 5: Examples of CSD profile from mouse visual cortex. Two second segment of continuous LFP recording from mouse visual cortex reveals two events with current sources/sinks in different locations.

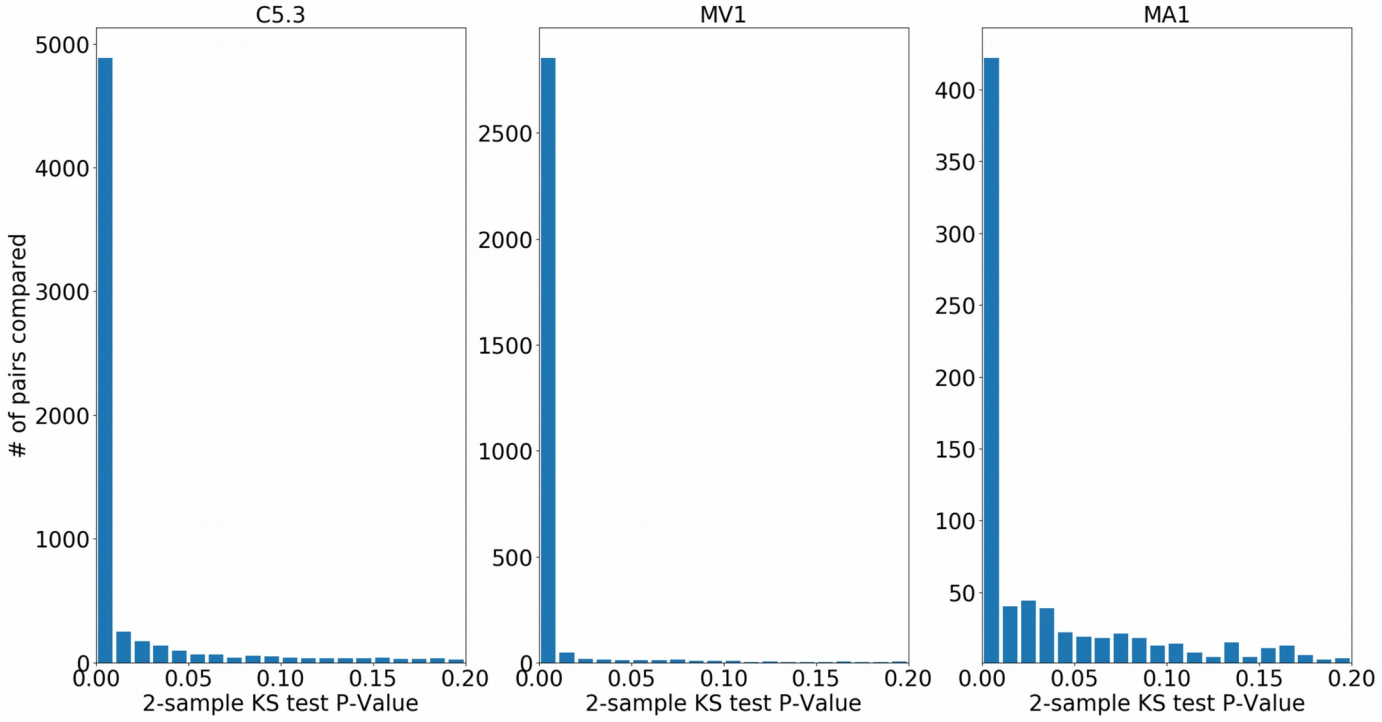

Figure 6: LEH-triggered spiking distributions are significantly different across neurons. The significance of the difference in the distributions between paris of neurons was assessed using 2 sample Kolmogorov-Smirnov tests with Bonferonni correction. Histograms show the distribution of p-values for all the unit pairs in particular recordings A: recording C5.3; B: recording MV1; C: recording MA1

Figure 7: Deeper layer neurons are more likely to fire first during LEC-events. Top: histograms show the number of LECs in which superficial layer (blue) neurons (0-425 um: mouse; 0-705um: cat) spiked before deeper layer (red) neurons (425-850um: mouse; 750-1500um: cat). Order was based on the means of Gaussian fits to LEC-triggered firing rate histograms. There is an overall bias for deeper layer neurons to spike first (see text for further description of statistical tests). Bottom: pooling all neuron relative firing rimes did not reveal substantial firing-order difference between superficial layer neurons (blue) or deeper layer neurons (rded). This was likely due to individual LECs electing different lag spiking which is averaged out when poling all relative times together.

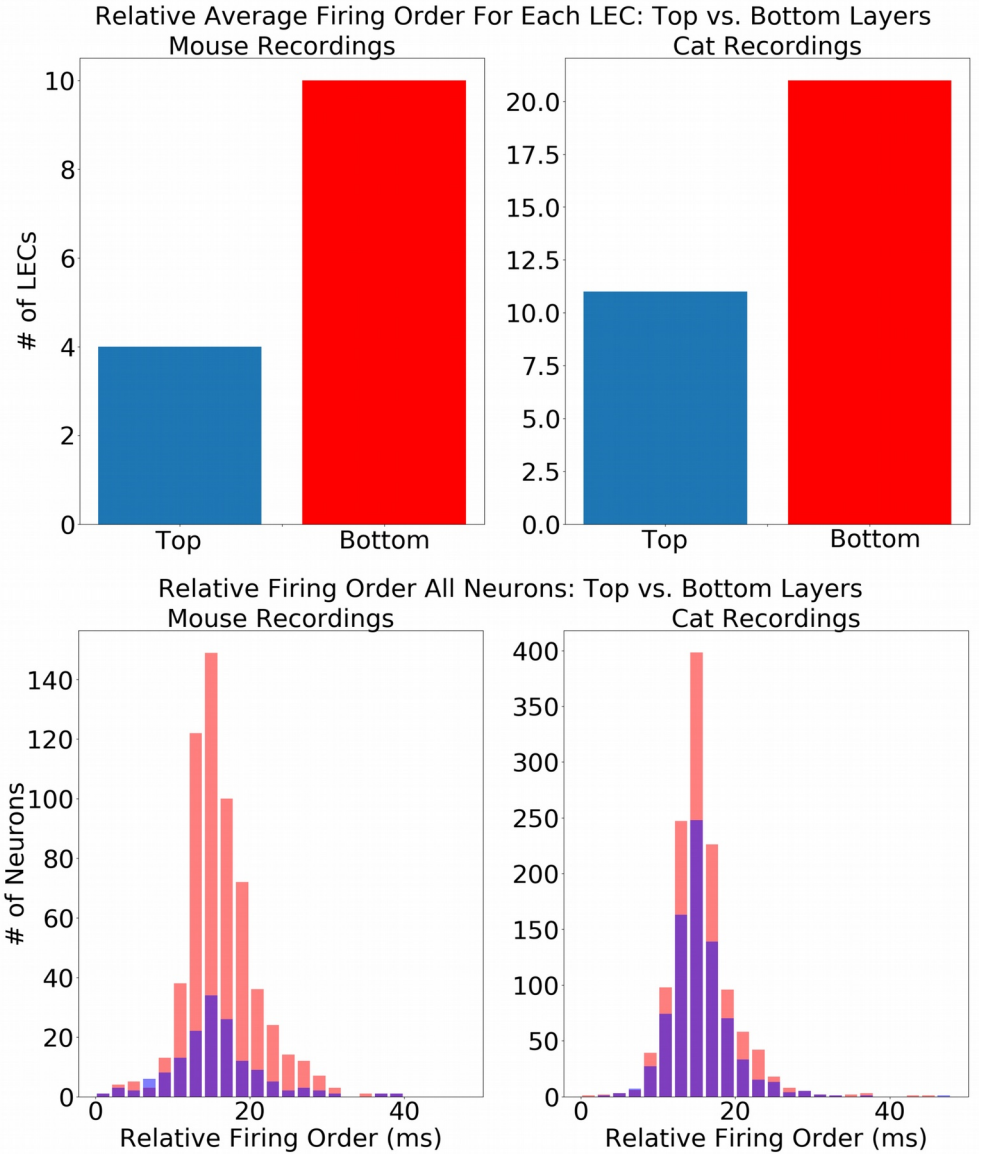

Figure 8: Example of preferential firing of some neurons to different LEC clusters. Percentage of spikes fired by each neuron (horizontal bars) that were locked to each of 3 LECs (blue, red, green) recorded in a cat C5.3 reveal that some LECs recruit neurons from different layers with red LEC recruiting more superficial neurons and green LEC recruiting deeper neurons.