



Figure 4. Effects of VIP activation are strongest in layer 4.

A. Mean sound modulation index during laser-on and laser-off trials, across cortical layers. VIP activation significantly suppressed modulation of neural activity by sound in layer 4, but not other layers. L2/3 laser-off 0.51 ± 0.04 , laser-on 0.47 ± 0.05 , $n = 22$; L4 laser-off 0.45 ± 0.04 , laser-on 0.28 ± 0.07 , $n = 34$; L5 laser-off 0.44 ± 0.02 , laser-on 0.44 ± 0.02 , $n = 122$; L6 laser-off 0.67 ± 0.03 , laser-on 0.64 ± 0.03 , $n = 45$; $\chi^2 = 14.47$, $p = 0.0023$, post-hoc signed-rank for L4 (MI laser-on vs laser-off) $p = 0.001$; $r = 0.40$).

B. The effect of VIP activation on sound modulation in layer 4 was driven by evoked activity in narrow-spiking neurons. Laser effect is the difference in evoked activity between laser-on and laser-off trials, normalized to each cell's peak laser-off firing rate. Evoked activity in layer 4 narrow-spiking cells was significantly suppressed by VIP activation (NS: $\chi^2 = 11.75$, $p = 0.008$, $n = 73$).

C. Laser effect for spontaneous activity was similar across all cortical layers (NS: $\chi^2 = 4.12$, $p = 0.24$, $n = 73$).

D. Depth distribution of cells that were either suppressed or disinhibited by VIP activation, for evoked activity. Peak density of disinhibited cells was in layer 5; suppressed cells showed an additional peak in layer 4 (arrow).

E. Depth distributions of suppressed and disinhibited cells for spontaneous activity were similar to each other. Peak densities were in layer 5.