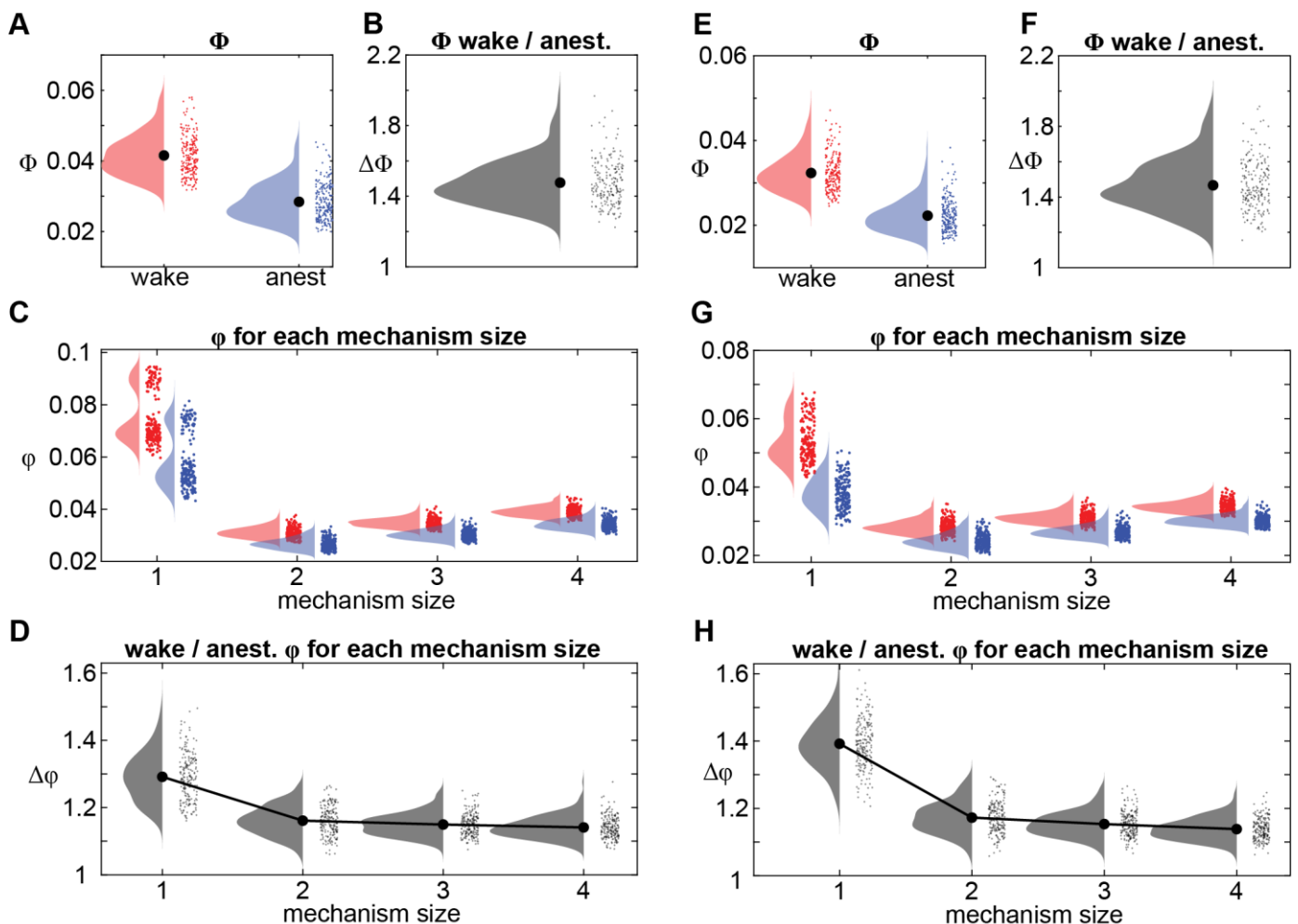


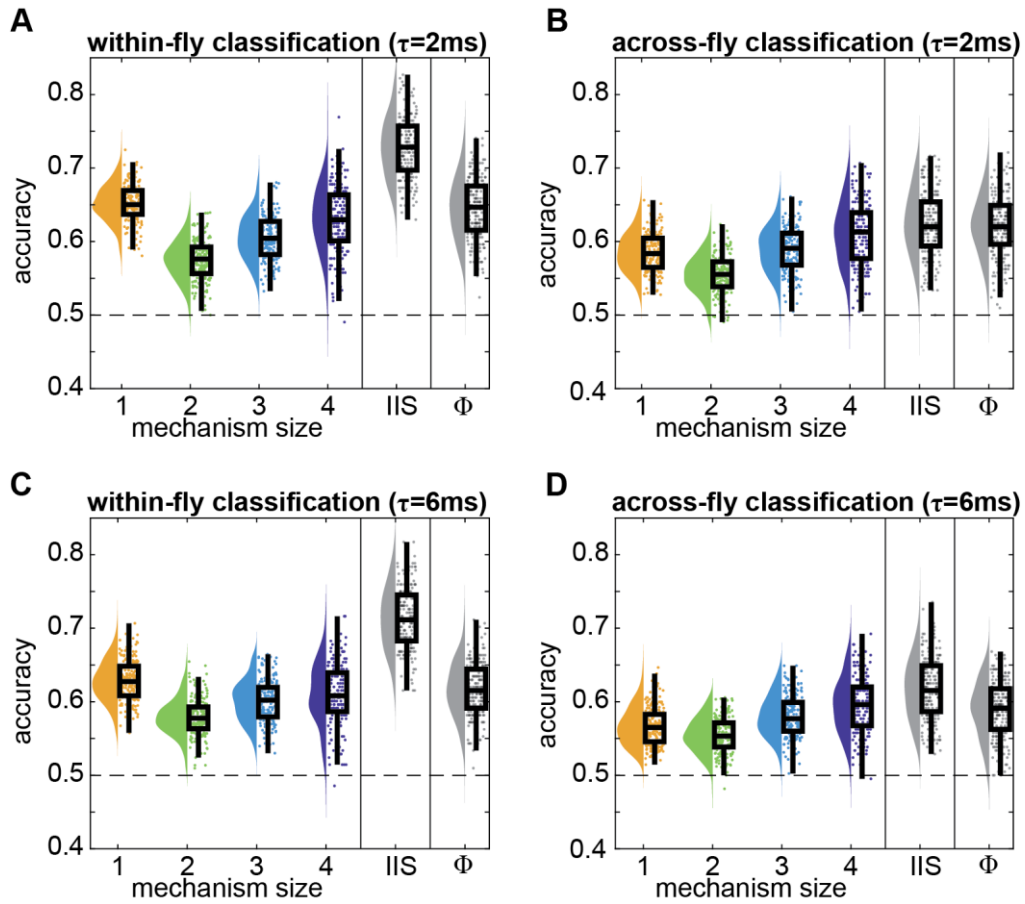
## S2 Text. Effect of anesthesia is consistent using different timesteps

In the main text, we computed system-level integrated information and integrated information structures (IIS) from TPMs built at the timescale  $\tau = 4$  ms. We chose this timescale based on the known physiology of synaptic interactions between neurons. Specifically, if  $\tau$  is too small, it will not capture causal interactions that maximise integrated information [1–3]. Thus we chose 4 ms as our timescale. A comprehensive search across  $\tau$  values is infeasible due to the computational cost of system-level integrated information.

To exclude the possibility that our results vary wildly depending on the specific  $\tau$  value selected, we selected a random sample of 200 channel sets (out of the total 1365 channel sets), and recomputed system-level integrated information and the IIS at two other  $\tau$  values, 2 ms and 6 ms. As can be seen in Figs S2 and S3, the effect of anesthesia remains consistent with what we report in the main text (Figs 4 and 5).



**Fig S2.** Effect of anesthesia on system-level integrated information ( $\Phi$ ) and the IIS is consistent for similar  $\tau$  values. Format is the same as Fig 4 in the main article. (A-D) Results with  $\tau = 2$  ms. (E-H) Results with  $\tau = 6$  ms.



**Fig S3.** Classification accuracy of wake and anesthesia is consistent for similar  $\tau$  values. Same format as Fig 5A and 5B in the main text. (A-B) Results with  $\tau = 2$  ms, (C-D) Results with  $\tau = 6$  ms.

## References

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