

### major revisions

1. indicate throughout that we are dealing with a time-series, not the raw fluorescence movies
2. stop using the word “intermittent”, and replace it with superresolution (which sets up a nice parallel in terms of Abbe’s limit and the Nyquist sampling theorem)
3. briefly explain general smc-em in text (ie, like 1-2 pages — unlike the current 6 page behemoth we have now), and move the behemoth to the appendix
4. in describing the stuff, start out with the simple vanilla case, ie, no stimulus, no intermittency; then add intermittency, then stimulus, then 1 spike history term (but mention the possibility of more)
5. note that this means that we first explain the conditional sampler assuming we have every observation. when we add intermittency, we can briefly describe in the main text that we are sampling now according to  $P(F_v|C_t)$ , where  $v > t$ , and relegate the details to the appendix.
6. note how this would change the figs (see the proposed new ones for the simulations), which of course requires changes in the results section of the text
7. add a data fig, comparing wiener, pf not using stimulus, and pf using stimulus
8. these proposed changes would also mean that the other figs should be modified somewhat

### minor revisions    za

1. change title to: Model-based inference of spike times given noisy and temporally subsampled calcium-sensitive fluorescence time-series
2. add bruno to author list
3. generall replace “fluorescence” with “intensity” to be more generally inclusive of ratiometric, and non-fluorescent images (eg, SHG)
4. abstract: replace “variances” with “errorbars”
5. note that we assume we have been given a time-series
6. keywords: replace “undersample” with “temporally subsample”
7. combine epi and confocal sentences
8. add holy ref in intro
9. last line of pg. 2, add “(though see Borst and Abarbanel, 2007)”
10. change “dt” to  $\Delta$  to avoid confusion with an integral

11. acknowledge in “Model” section that intermittent observations may come from camera malfunction, or other weird stuff
12. change  $\alpha$  and  $\beta$  to  $F_{max}$  and  $F_{min}$
13. fix up discussion about intermittent using 2p vs. epi
14. in discussion of noise, mention work in progress on spatiotemporal filtering of raw movie data
15. mention SHG after eq (2)
16. in discussion of Ca dynamics
17. change  $\tau_c$  and  $\sigma_c$  to simply  $\tau$  and  $\sigma$
18. reword the sentence before eqs (7) and (8)
19. i dropped  $T_r$  subscript in eq (24)
20. pg 13 has a  $p(F_v|[Ca^{2+}]_v)$ , which should be  $P_{\hat{\theta}}(\cdot)$
21. eqs (31) and (32) should explicitly write posterior
22. remove “our” from from summary paragraph