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## Period windowing (1)

- ✂ We have a periodic signal  $f(t')$ , taken from our observed system output (here, neuron spikes)
- ✂ We wish to split it into windows  $f_1(t), f_2(t), \dots, t \in [0, 1]$ , such that  $f_i(1) = f_{i+1}(0)$  (periodicity)
- ✂ Then  $f_i(t)$  is a function representing the  $i$ 'th period of the signal
  - ▶ Eg. if  $f(t') = \sin(\frac{t'}{2\pi})$  with  $t \in [0, \infty)$ , then  $f_1(t) = \sin(\frac{t}{2\pi})$ ,  $f_2(t) = \sin(\frac{t}{2\pi} + 2\pi)$ ,  $f_3(t) = \sin(\frac{t}{2\pi} + 4\pi)$ ,  $\dots$ , with  $t \in [0, 1]$
  - ▶ By periodicity we have  $f_i(t) = f_j(t)$ , and  $f_i(1) = f_{i+1}(0)$
- ✂ Fitting a model  $t \rightarrow f_i(t)$  to these function observations gives us the periodic orbit model  $f^*(t)$  at the current parameter value
- ✂ It's hard to split data up into these periods!