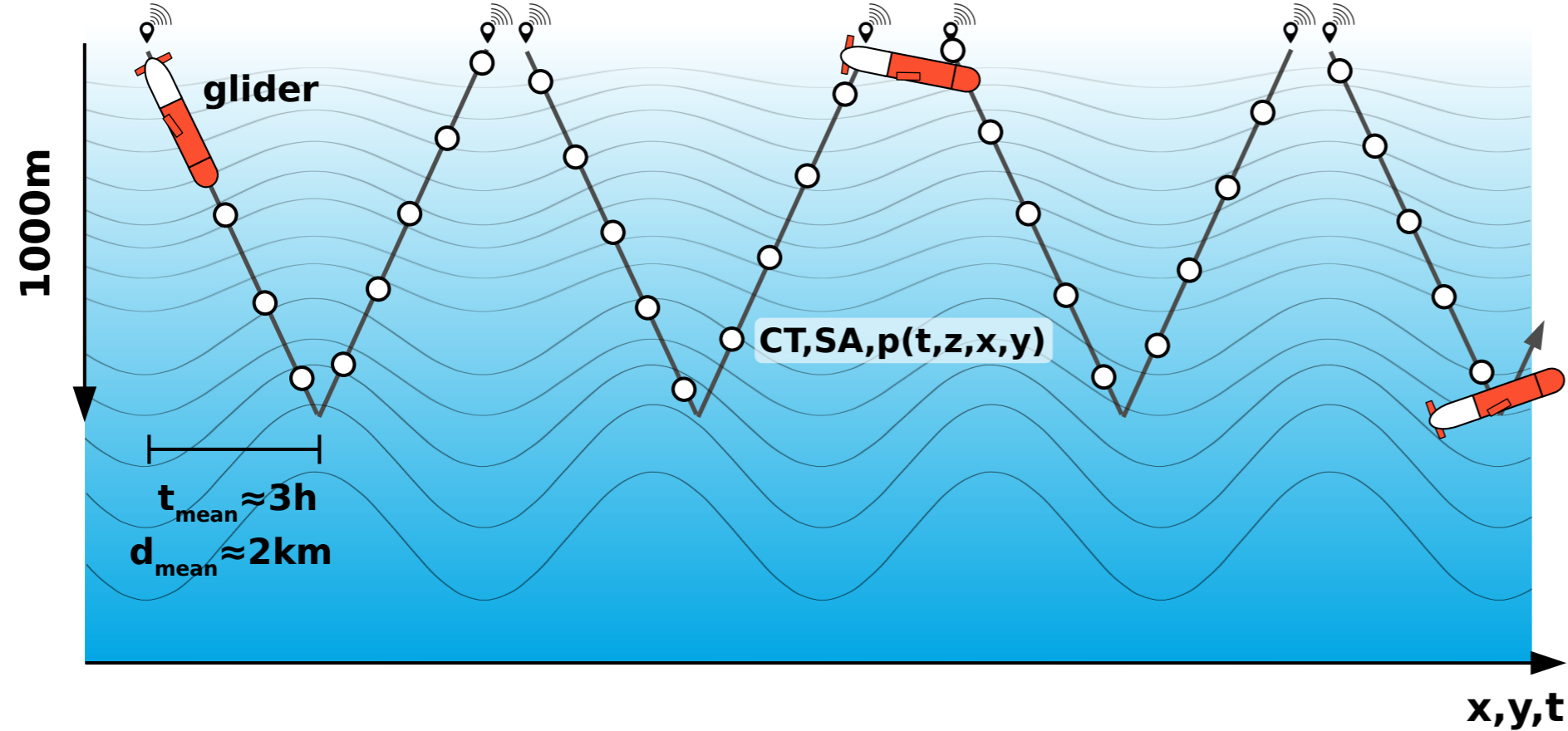


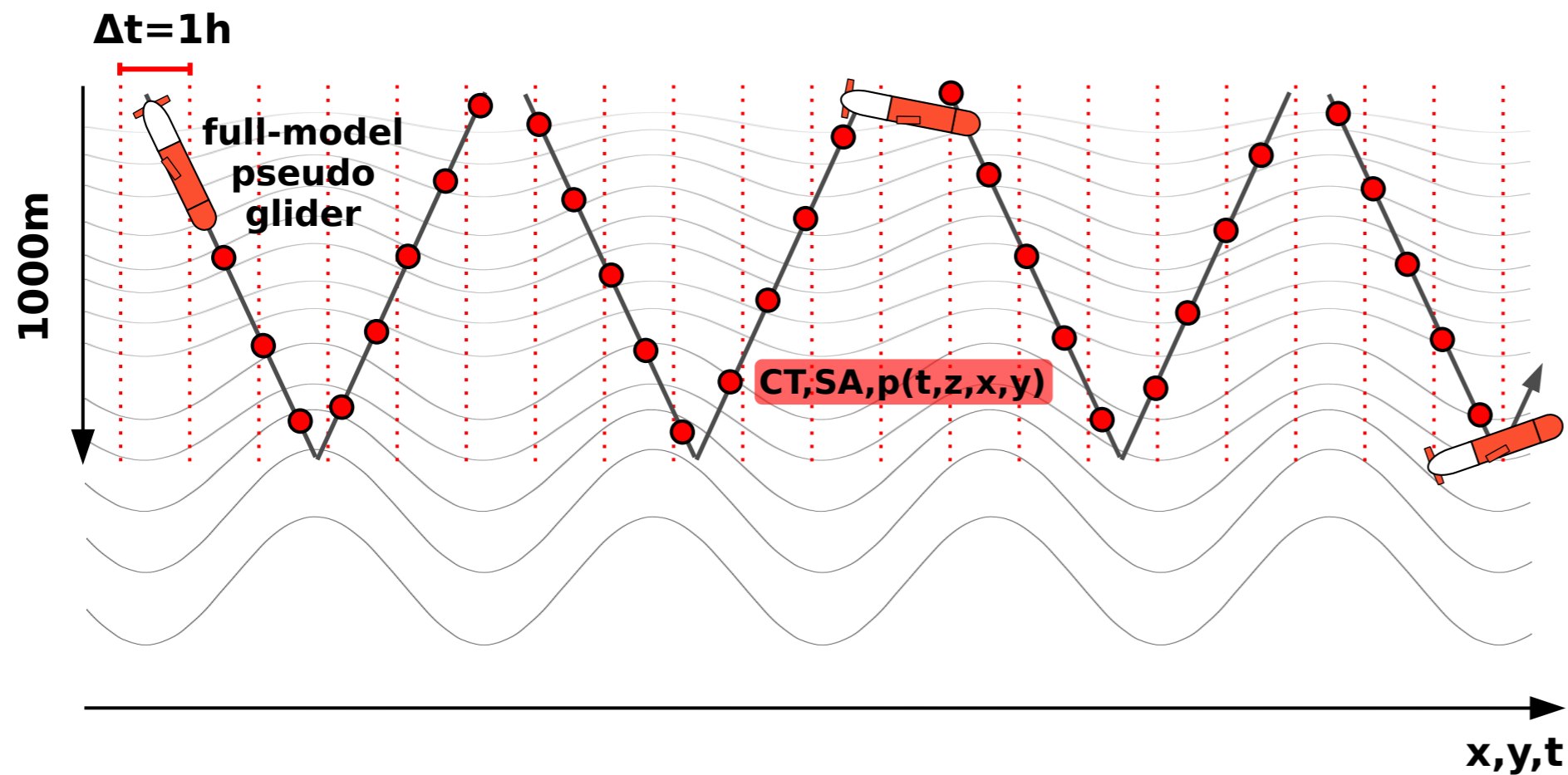
glider observations



**(I)** Divide glider time series into descending and ascending profiles and grid in vertical 10m bins.

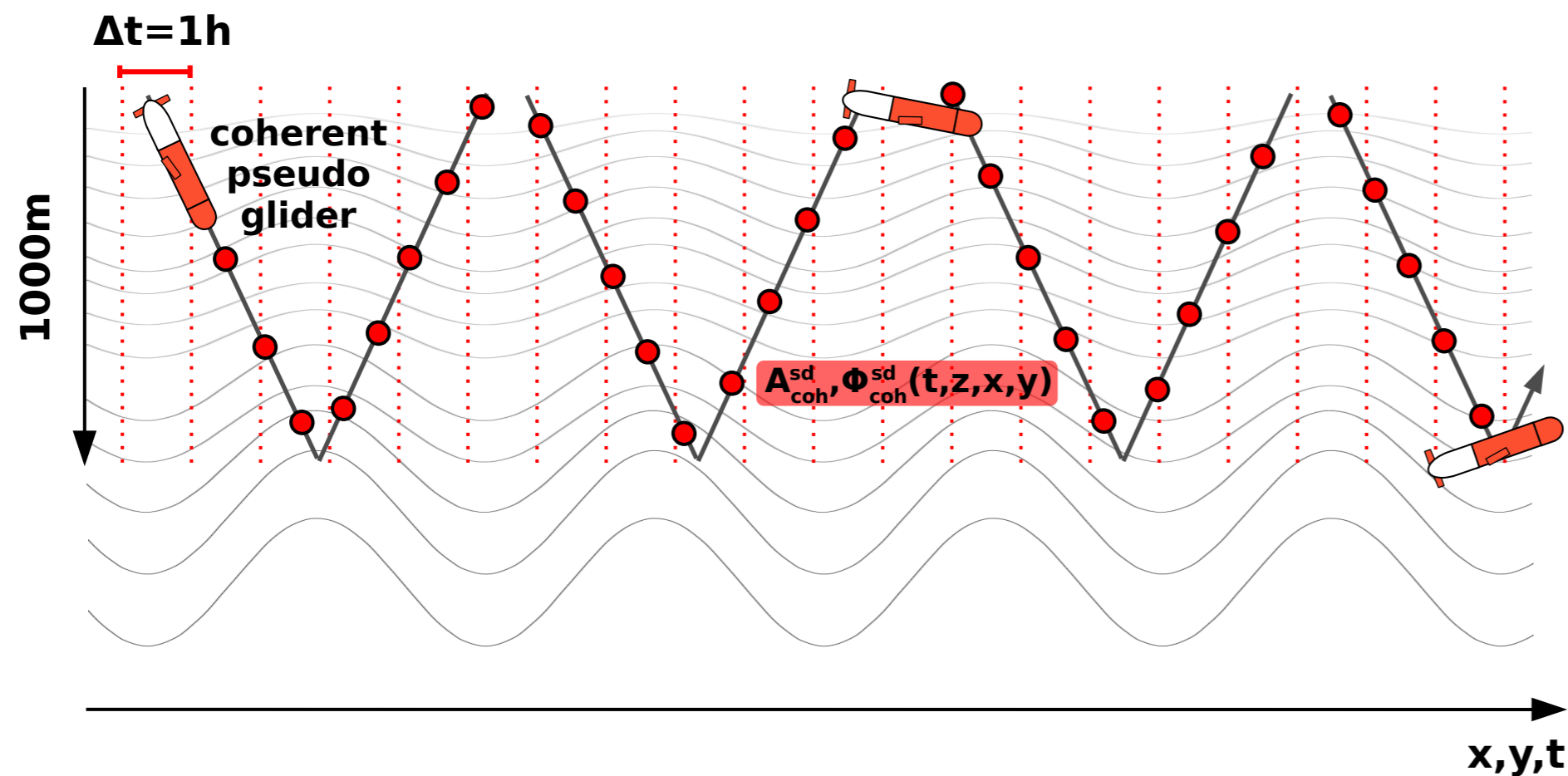
**(II)** Apply sinusoidal fit on  $\eta$  in running 3-day windows for each depth level individually in the  $x, y, t$ -plane to obtain the diurnal and semidiurnal  $\mathbf{A}$  and  $\Phi$  for the gridded glider track.

full-model pseudo glider



Extract the full-model  $\mathbf{CT}$ ,  $\mathbf{SA}$ , and  $\mathbf{p}$  in the time period 12 August-23 October 2014 at hourly resolution and linearly interpolate onto the glider time series, before applying **(I)** and **(II)**.

coherent pseudo glider



Reconstruct time series of the semidiurnal coherent vertical displacements  $\eta_{\text{coh}}$  in the time period 12 August-23 October 2014 for each grid point in three-dimensional space. Apply for each grid point the sinusoidal fit in running 3-day windows, linearly interpolate  $\mathbf{A}$  and  $\Phi$  onto the glider time series, and apply **(I)**.