



Figure 3 – figure supplement 1: **Persistent homology analysis of periodic behavior in the transcriptional time series of *kai* genes of *Anabaena*.** Left panels: simplices obtained during Vietoris-Rips filtrations of the time series of *kaiA*, *kaiB* and *kaiC*. The simplices shown, which represent a single connected component in the 0-cycle barcode of the data, correspond to the smallest value of the filtration value ϵ of the most persistent 1-cycle in the right panel (red arrow). The values of the delays τ for each phase portrait were $\tau = 7.1 \pm 1.2$ hr for *kaiA*, $\tau = 6.7 \pm 1.2$ hr for *kaiB* and $\tau = 7.3 \pm 1.1$ ($n \geq 3$) hr for *kaiC*, consistently with a circadian periodicity. Right panels: Barcodes of the 0-cycles and 1-cycles corresponding to the point cloud in the respective phase portrait on the left. The length of the longest line segment in the 1-cycle provides a measure of the persistence of the primary void in the associated complex in the corresponding left panel. Persistent homology was computed via JavaPlex.