

$$u(x, t) = \sum_i^N a_i(t) \phi_i(x)$$

$$v(x, t) = \sum_i^M b_i(t) \psi_i(x)$$

$$\dot{a}_i = \langle \mathcal{F}(\phi_i, \psi_k), \phi_j \rangle \mathcal{F}(a_i, b_k)$$

$$\dot{b}_k = \langle \mathcal{G}(\phi_i, \psi_k), \psi_l \rangle \mathcal{G}(a_i, b_k)$$

The SINDy reduction preserves properties such as periodicity, amplitude, fixed points and limit cycles
Figure shows the alternans

