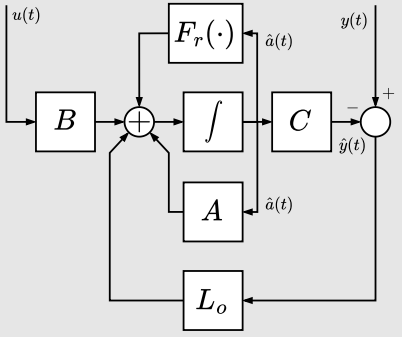
PDE system

$$\partial_t x(z,t) = \mathcal{A}x(z,t) + B(z)u_d(t) + G\,F(x)$$

$$\mathfrak{B}x(z,t) = B_b u_b(t)$$

$$y(t) = \mathcal{C}x(z,t)$$

Observer design



POD basis computation

Measure $y(t)$:

	t_1	t_2	$\cdots$	t_{n_t}
y_1				
y_2				
$\vdots$				
y_{n_y}				

$$(\mathcal{K})_{ij} = \frac{1}{N_t}\langle x_j, x_i \rangle$$

$$\mathcal{K}v_i = \lambda_i v_i$$

$$\phi_i = \frac{1}{\sqrt{\lambda_i}}\mathcal{X}v_i$$

Reduced order model

Set: $x_a(z,t) = \Phi(z)a(t)$

$$\dot{a}(t) = Aa(t) + B_d u_d(t) + F_r(a(t))$$

$$Ba(t) = B_b u_b(t)$$

$$y_a(t) = Ca(t)$$