

Extend PNLSS

Extend PNLSS with output-based nonlinearity.

Data generated from discrete system

$$\mathbf{y} = [y, \dot{y}], \quad \dot{y}_{nl} = y_2$$
$$f_{nl} = \tanh(\dot{y}_{nl}/\varepsilon)$$

- ▶ for high and low level: (stick or slip)
Identified as linear system
- ▶ Intermediate level:
Identified for some levels
- ▶ Maybe due to “bad” initial guess(BLA)
Same behavior seen for unilateral spring
- ▶ Solution?
Improve guess by FNSI[1](nonlinear subspace methods by J.P.)
- ▶ Drawbacks:
 - Specify ε a priori
 - Does output(vel) correspond to slider vel?

Validation: different f_{nl} coeff.

Upper: $0.1 * f_{nl}$, lower: f_{nl}

