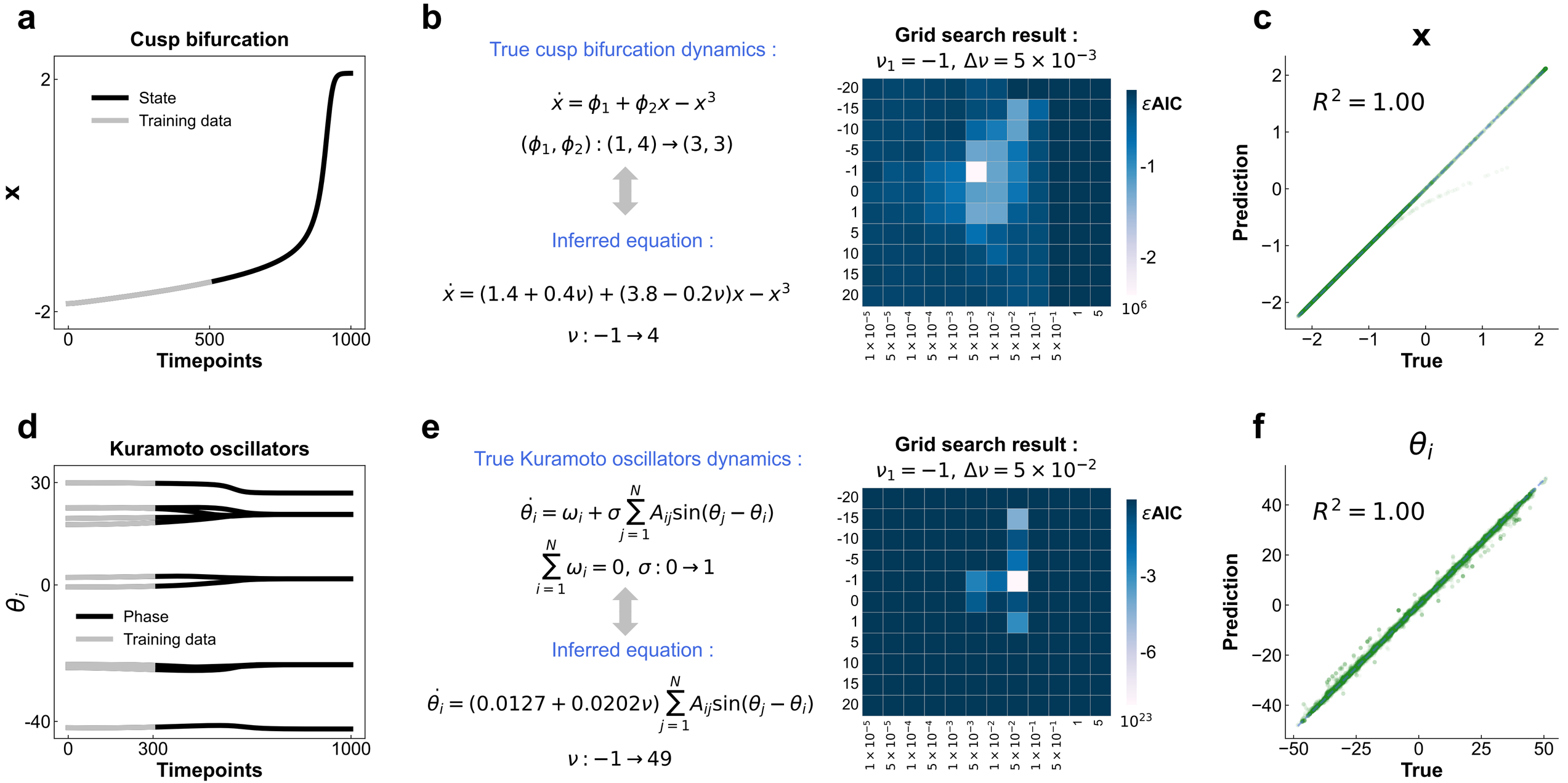
a
Cusp bifurcation
State
Training data
x
Timepoints
b
True cusp bifurcation dynamics :
$\dot{x} = \phi_1 + \phi_2 x - x^3$
$(\phi_1, \phi_2) : (1, 4) \to (3, 3)$
Inferred equation :
$\dot{x} = (1.4 + 0.4\nu) + (3.8 - 0.2\nu)x - x^3$
$\nu : -1 \to 4$
Grid search result :
$\nu_1 = -1,\ \Delta\nu = 5 \times 10^{-3}$
εAIC
c
x
$R^2 = 1.00$
Prediction
True
d
Kuramoto oscillators
Phase
Training data
θ_i
Timepoints
e
True Kuramoto oscillators dynamics :
$\dot{\theta}_i = \omega_i + \sigma \sum_{j=1}^{N} A_{ij} \sin(\theta_j - \theta_i)$
$\sum_{i=1}^{N} \omega_i = 0,\ \sigma : 0 \to 1$
Inferred equation :
$\dot{\theta}_i = (0.0127 + 0.0202\nu) \sum_{j=1}^{N} A_{ij} \sin(\theta_j - \theta_i)$
$\nu : -1 \to 49$
Grid search result :
$\nu_1 = -1,\ \Delta\nu = 5 \times 10^{-2}$
εAIC
f
θ_i
$R^2 = 1.00$
Prediction
True