**Fitzhugh-Nagumo Model with 3 parameters**

Ground truths of parameter: a=0.3, b=0.15, c=0.5

ODE:

dx1 = c\* (x1 - (x1^3)/3 + x2)

dx1 = (1/c) \* (x1 - a + b \*x2)

initial state x0 = [-1 1];

observation of x1:

sigma2(std^2)= 0.01

final time: 10

observation time step: 1

parameter ranges:

a \in [0.1,0.9]

b \in [0,0.3]

c \in [0, 0.5]

number of interval on each dimention) numInt=50;

**Laub-Loomis model with 13 parameters**

Ground truths of parameter: k1=0.9, k2=0.8, k3=0.3, k4=2.5, k5=1.3, k6=1.8, k7=1.4, k8=1.5, k9=0.6, k10=0.7, k11= 1.0, k12=3.1, k13=1.5

dx1 = k7 \* x3 - k1 \* x1

dx2 = k4 \* x5 - k8 \* x2

dx3 = k9 \* x7 - k2 \* x3 \* x2

dx4 = 2 - k5 \* x4 \* x3

dx5 = k10 \* x1 - k11 \* x4 \* x5

dx6 = k3 \* x1 - k12 \* x6

dx7 = k6 \* x6 - k13 \* x7 \* x2

initial state x0 = [1.2 1.0 1.5 2.4 1.0 0.1 0.45]

observation of x1:

sigma2(std^2)= 0.0005

final time: 5

observation time step: 0.5

parameter ranges:

k1 \in [0, 3.2]

k2 \in [0, 3]

k3 \in [0, 2.5]

k4 \in [0, 5]

k5 \in [0, 3.5]

k6 \in [0, 5]

k7 \in [0, 3.8]

k8 \in [0, 3.8]

k9 \in [0, 2.9]

k10 \in [0, 2.9]

k11 \in [0, 3.3]

k12 \in [0, 6.4]

k13 \in [0, 4.7]

(number of interval on each dimention) numInt=40;