|  |  |
| --- | --- |
| Type1:  star |  |
| Type2:  node |  |
| Type3:  Saddle point |  |
| Type4:  center |  |
| Type5:  focus |  |
|  |  |

程式碼:

1.主程式:

clc;clear;close all;

an = 24 %切割圓周角

for i=1:an %建立圓周座標(半徑為4)

xp(i,1) = 4\*cos(pi\*i\*2/an);

xp(i,2) = 4\*sin(pi\*i\*2/an);

end

for i=1:an %以圓周座標分別跑圖

x = [xp(i,1) xp(i,2)]'

x1arr = [0,0,0,0]'; %x座標位置初始

x2arr = x1arr; %y座標位置初始

tarr = x1arr;

delt = 0.0002; %資料delta區間

x1arr(1) = x(1);

x2arr(1) = x(2);

%for i=1:20000 %type 5 使用

for i=1:2000

xN = myFindNextPos(x,delt);

x1arr(i+1) = xN(1);

x2arr(i+1) = xN(2);

tarr(i) = delt\*i; %時間資料

x = xN;

end

figure(1);

plot(x1arr,x2arr,'b');

hold on; %疊圖

end

2.函式庫:

function xNew = myFindNextPos(x,delt)

x\_dot = zeros(size(x))

xNew = x\_dot;

% A = [-2 0;0 -2]; %type 1:star

% A = [-2 0;0 -6]; %type 2:node

% A = [-2 0;0 1.5];%type 1:saddle point

% A = [0 1;-1 0]; %type 1:center

A = [-2 1;-1 -2]; %type 1:focus

x\_dot = A\*x

xNew = x + x\_dot\*delt;

return;

end