畫圖

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code

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import numpy as np
import matplotlib.pyplot as plt
from sympy.solvers import solve
from sympy import Symbol
import math

x2 = np.linspace( 0.3 ,1.402 ,10)
y2 = np.linspace( 4.09 , 4.7,1000)
a2, b2 = np.meshgrid( x2 , y2 )
C2 = (a2-0.59) ** 2 + (b2-3.76 )** 2 - 0.77
plt.contour(a2,b2,C2,[0],cmap='gist_gray')

x3 = np.linspace( -0.38 ,0.3077,10)
y3 = np.linspace( 3.3 , 4.65,1000)
a3, b3 = np.meshgrid( x3 , y3 )
C3 = (a3-0.48) ** 2 + (b3-3.76 )** 2 - 0.72
plt.contour(a3,b3,C3,[0],cmap='gist_gray')

x4 = np.linspace( -0.33333 ,-0.249,10)
y4 = np.linspace( 3.3, 4.1,1000)
a4, b4 = np.meshgrid( x4 , y4 )
C4 = (a4-0.54) ** 2 + (b4-3.65 )** 2 - 0.72
plt.contour(a4,b4,C4,[0],cmap='gist_gray')

x5 = np.linspace( -0.287 ,-0.18,10)
y5 = np.linspace( 3.4, 4.213,1000)
a5, b5 = np.meshgrid( x5 , y5 )
C5 = (a5-0.42) ** 2 + (b5-3.84 )** 2 - 0.5
plt.contour(a5,b5,C5,[0],cmap='gist_gray')



y6 = np.arange(3.51, 3.96, 0.000001)
x6=-1/20*y6-0.6/20
plt.plot(x6,y6,'k-')

y7 = np.arange(3.58, 3.745, 0.000001)
x7=-1/2*y7+3.31/2
plt.plot(x7,y7,'k-')
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x8 = np.linspace( -1 ,-0.05 ,10)
y8 = np.linspace( 3.589 , 4.338,1000)
a8, b8 = np.meshgrid( x8 , y8 )
C8 = (a8-0.95) ** 2 + (b8-3.84 )** 2 - 1.25
plt.contour(a8,b8,C8,[0],cmap='gist_gray')

x9 = np.arange(-0.164, -0.052, 0.000001)
y9=-1.5*x9+3.48
plt.plot(x9,y9,'k-')

x10 = np.arange(-0.167, -0.14, 0.000001)
y10=-3*x10+3.4
plt.plot(x10,y10,'k-')

y11 = np.arange(3.82, 4.1, 0.000001)
x11=1/7*y11-4.8/7
plt.plot(x11,y11,'k-')

x12 = np.linspace(-0.1092,-0.0075,10)
y12 = np.linspace( 3.758, 4.036,1000)
a12, b12 = np.meshgrid( x12 , y12 )
C12 = (a12-0.77) ** 2 + (b12-4.2 )** 2 - 0.8
plt.contour(a12,b12,C12,[0],cmap='gist_gray')

x13 = np.linspace(-0.0235,-0.007,10)
y13 = np.linspace( 3.758, 4.139,1000)
a13, b13 = np.meshgrid( x13 , y13 )
C13 = (a13-1.16) ** 2 + (b13-3.95 )** 2 - 1.4
plt.contour(a13,b13,C13,[0],cmap='gist_gray')

x14 = np.linspace(-0.0766,-0.0313,10)
y14 = np.linspace( 3.578, 3.906,1000)
a14, b14 = np.meshgrid( x14 , y14 )
C14 = (a14-0.76) ** 2 + (b14-3.85 )** 2 - 0.7
plt.contour(a14,b14,C14,[0],cmap='gist_gray')

x15 = np.linspace(-0.11,-0.007,10)
y15 = np.linspace( 3.537, 3.67,1000)
a15, b15 = np.meshgrid( x15 , y15 )
C15 = (a15+0.12) ** 2 + (b15-3.65 )** 2 - 0.013
plt.contour(a15,b15,C15,[0],cmap='gist_gray')

y16 = np.arange(3.654, 3.893, 0.000001)
x16=-1/3*y16+3.9/3
plt.plot(x16,y16,'k-')

x17 = np.linspace(0.068,0.16,10)
y17 = np.linspace( 3.654, 4.096,1000)
a17, b17 = np.meshgrid( x17 , y17 )
C17 = (a17-0.66) ** 2 + (b17-3.78 )** 2 - 0.35
plt.contour(a17,b17,C17,[0],cmap='gist_gray')

y18 = np.arange(3.992, 4.096, 0.000001)
x18=1/10*y18-2.5/10
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plt.plot(x18,y18,'k-')

x19 = np.linspace(0.1492,0.293,10)
y19 = np.linspace( 3.992, 4.26,1000)
a19, b19 = np.meshgrid( x19 , y19 )
C19 = (a19+0.2) ** 2 + (b19-4.35 )** 2 - 0.25
plt.contour(a19,b19,C19,[0],cmap='gist_gray')

x20 = np.linspace(0.2773,0.364,10)
y20= np.linspace( 3.947, 4.4,1000)
a20, b20 = np.meshgrid( x20 , y20 )
C20 = (a20+0.61) ** 2 + (b20-4.35 )** 2 - 0.95
plt.contour(a20,b20,C20,[0],cmap='gist_gray')

x21 = np.linspace(0.2773,0.293,10)
y21= np.linspace( 3.949, 4.26,1000)
y21=20*x21-1.6
plt.plot(x21,y21,'k-')
# x21 = np.arange(0.2773)
# y21=20*x21+1.6
# y21=np.arange(4.269)
# plt.plot(x21,y21,'k-')
x22a = np.linspace(0.3652,0.4163,10)
y22a= np.linspace( 4.269, 4.297,1000)
y22a=(0.028999*x22a+0.207)/(0.05109)
plt.plot(x22a,y22a,'k-')

x22b = np.linspace(0.3637,0.446,10)
y22b= np.linspace( 4.306, 4.348,1000)
y22b=(0.05199*x22b-0.45101)/(0.09910)
plt.plot(x22b,y22b,'k-')

x22c = np.linspace(0.3853,0.4845,10)
y22c= np.linspace( 4.351, 4.399,1000)
y22c=(-0.048*x22c-0.4131)/(-0.0992)
plt.plot(x22c,y22c,'k-')

x22d = np.linspace(0.4221,0.5277,10)
y22d= np.linspace( 4.4, 4.449,1000)
y22d=(-0.048999*x22d-0.44395710)/(-0.105599)
plt.plot(x22d,y22d,'k-')

x22e = np.linspace(0.463,0.5776,10)
y22e= np.linspace( 4.45, 4.499,1000)
y22e=(-0.04899*x22e-0.487283)/(-0.114599)
plt.plot(x22e,y22e,'k-')

x23a = np.linspace(0.4351,0.4853,10)
y23a= np.linspace( 4.303, 4.335,1000)
y23a=(0.032*x23a-0.2315402)/( -0.0502)
plt.plot(x23a,y23a,'k-')

x23b = np.linspace(0.4415,0.5357,10)
y23b= np.linspace( 4.237, 4.299,1000)
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y23b=(0.0620*x23b-0.4323387999)/(-0.094199)
plt.plot(x23b,y23b,'k-')

x23c = np.linspace(0.4916,0.5873,10)
y23c= np.linspace( 4.167, 4.233,1000)
y23c=(0.0659999*x23c-0.4375437)/(- 0.0957)
plt.plot(x23c,y23c,'k-')

x23d = np.linspace(0.5416,0.6286,10)
y23d= np.linspace( 4.101, 4.164,1000)
y23d=(0.06299*x23d-0.39638880)/(- 0.087)
plt.plot(x23d,y23d,'k-')

x23e = np.linspace(0.5827,0.6669,10)
y23e= np.linspace( 4.034, 4.098,1000)
y23e=(0.064*x23e-0.3823444)/(- 0.0842)
plt.plot(x23e,y23e,'k-')

x23f = np.linspace(0.6182,0.6995,10)
y23f= np.linspace( 3.968, 4.033,1000)
y23f=(0.065*x23f- 0.3680659)/(- 0.0813)
plt.plot(x23f,y23f,'k-')

x23g = np.linspace(0.6519,0.7288,10)
y23g= np.linspace( 3.901, 3.966,1000)
y23g=(0.065*x23g- 0.3473589)/(- 0.076899999)
plt.plot(x23g,y23g,'k-')

x23h = np.linspace(0.68,0.7537,10)
y23h= np.linspace( 3.834, 3.9,1000)
y23h=(-0.0659999*x23h+0.332309)/(0.073699)
plt.plot(x23h,y23h,'k-')

x24 = np.arange(-0.1071, -0.085, 0.000001)
y24=-8*x24+2.68
plt.plot(x24,y24,'k-')

x25 = np.linspace(-0.0845,0.0956,10)
y25= np.linspace( 3.0214, 3.353,1000)
y25=-(20*(x25)**3+1.7*x25-3.2)
plt.plot(x25,y25,'k-')

x26 = np.linspace(0.0956,0.7668,10)
y26= np.linspace( 3.02, 3.508,1000)
y26=1.1*(x26-0.1)**2+3.02
plt.plot(x26,y26,'k-')

x27 = np.linspace(0.757,0.9,10)
y27= np.linspace( 3.776, 3.89,1000)
a27, b27 = np.meshgrid( x27 , y27 )
C27 = (a27-0.9) ** 2 + (b27-3.73 )** 2 - 0.023
plt.contour(a27,b27,C27,[0],cmap='gist_gray')

x28 = np.linspace(0.9,1.1,10)
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y28= np.linspace( 3.7,3.89 ,1000)
a28, b28 = np.meshgrid( x28 , y28 )
C28 = 2*(a28-0.9) ** 2 + (b28-3.73 )** 2 - 0.023
plt.contour(a28,b28,C28,[0],cmap='gist_gray')

x29 = np.linspace(0.7668,1.0073,10)
y29= np.linspace( 3.5, 3.7,1000)
a29, b29 = np.meshgrid( x29 , y29 )
C29 = 0.95*(a29-0.79) ** 2 + (b29-3.72 )** 2 - 0.045
plt.contour(a29,b29,C29,[0],cmap='gist_gray')

x30 = np.linspace(0.79,0.92,10)
y30= np.linspace( 3.6, 3.79,1000)
a30, b30 = np.meshgrid( x30 , y30 )
C30 = (a30-0.82) ** 2 + (b30-3.7 )** 2 - 0.01
plt.contour(a30,b30,C30,[0],cmap='gist_gray')

x31 = np.linspace(0.77,0.818,10)
y31= np.linspace( 3.631, 3.7,1000)
a31, b31 = np.meshgrid( x31 , y31 )
C31 = (a31-0.78) ** 2 + (b31-3.67 )** 2 - 0.0015
plt.contour(a31,b31,C31,[0],cmap='gist_gray')


x32 = np.linspace( 0.806 ,0.963 ,10)
y32 = np.linspace( 3.7 , 3.852,1000)
a32, b32 = np.meshgrid( x32 , y32 )
C32 =(a32-0.9)**2+(b32-3.757)**2-0.009
plt.contour(a32,b32,C32,[0],cmap='gist_gray')

x33 = np.linspace( 0.878 ,0.962 ,10)
y33 = np.linspace( 3.795 , 3.825,1000)
a33, b33 = np.meshgrid( x33 , y33 )
C33 =(a33-0.92)**2+(b33-3.84)**2-0.002
plt.contour(a33,b33,C33,[0],cmap='gist_gray')

x34 = np.arange(1.402, 1.597, 0.000001)
y34=-3.5*x34+9
plt.plot(x34,y34,'k-')

x35 = np.arange(1.57, 2.024, 0.000001)
y35=-5*(x35-1.75)**3-0.6*(x35-1.75)+3.3
plt.plot(x35,y35,'k-')

x36 = np.arange(1.388, 1.829, 0.000001)
y36=-5*x36**3+22.5*x36**2-33.75*x36+16.875-1.2*x36+1.8+3.4
plt.plot(x36,y36,'k-')

x37 = np.arange(1.335, 1.829, 0.000001)
y37=-4*x37**3+18*x37**2-27.7*x37+14.55+3.2
plt.plot(x37,y37,'k-')

x38 = np.arange(1.17, 1.67, 0.000001)
y38=-5*x38**3+24.75*x38**2-42.0375*x38+27.240625
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plt.plot(x38,y38,'k-')

x39 = np.arange(1.063, 1.3224, 0.000001)
y39=-5*x39**3+22.5*x39**2-34.55*x39+20.975
plt.plot(x39,y39,'k-')

x40 = np.arange(0.9711, 1.3224, 0.000001)
y40=-3*x40**3+13.5*x40**2-20.55*x40+13.575
plt.plot(x40,y40,'k-')

x41 = np.arange(1.5, 2.024, 0.000001)
y41=-0.7*x41+4.45
plt.plot(x41,y41,'k-')

x42 = np.arange(1.5, 1.67, 0.000001)
y42=-2.5*x42+6.95
plt.plot(x42,y42,'k-')

x43 = np.arange(0.02, 0.1, 0.000001)
y43=-5*x43**2+x43+3.28
plt.plot(x43,y43,'k-')

x44 = np.linspace( 0.187 ,0.4091 ,10)
y44 = np.linspace( 2.9382 , 3.0447,1000)
a44, b44 = np.meshgrid( x44 , y44 )
C44 =(a44-0.41)*(b44-(0.1*a44)-3.01)-0.0001
plt.contour(a44,b44,C44,[0],cmap='gist_gray')

x45 = np.linspace( 0.826 ,0.9757 ,10)
y45 = np.linspace( 2.628 , 3.51,1000)
a45, b45 = np.meshgrid( x45 , y45 )
C45 =18*(a45-0.9)+np.arctan(10*(b45-3.1))
plt.contour(a45,b45,C45,[0],cmap='gist_gray')

x46 = np.linspace( 0.975 ,1.085 ,10)
y46 = np.linspace( 2.628 , 2.8579,1000)
a46, b46 = np.meshgrid( x46 , y46 )
C46 =(a46-0.7)**2+(b46-2.9)**2-0.15
plt.contour(a46,b46,C46,[0],cmap='gist_gray')

x47 = np.linspace( 1.089 ,1.2776 ,10)
y47 = np.linspace( 2.6535 , 2.8597,1000)
a47, b47 = np.meshgrid( x47 , y47 )
C47 =(a47-1.45)**2+(b47-3)**2-0.15
plt.contour(a47,b47,C47,[0],cmap='gist_gray')

x48 = np.linspace( 1.18 ,1.2774 ,10)
y48 = np.linspace( 2.654 , 3.0305,1000)
a48, b48 = np.meshgrid( x48 , y48 )
C48 =(a48-1.68)**2+(b48-2.95)**2-0.25
plt.contour(a48,b48,C48,[0],cmap='gist_gray')

x49 = np.linspace( 1.468 ,1.53 ,10)
y49 = np.linspace( 2.67 , 3.0475,1000)
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a49, b49 = np.meshgrid( x49 , y49 )
C49 =(a49-0.98)**2+(b49-2.8)**2-0.3
plt.contour(a49,b49,C49,[0],cmap='gist_gray')

x50 = np.linspace( 1.41 ,1.5133 ,10)
y50 = np.linspace( 2.67 , 2.8886,1000)
a50, b50 = np.meshgrid( x50 , y50 )
C50 =(a50-0.98)**2+(b50-2.55)**2-0.3
plt.contour(a50,b50,C50,[0],cmap='gist_gray')

x51 = np.linspace( 1.41 ,1.42 ,10)
y51 = np.linspace( 2.74 , 2.8911,1000)
a51, b51 = np.meshgrid( x51 , y51 )
C51 =(a51-0.87)**2+(b51-2.8)**2-0.3
plt.contour(a51,b51,C51,[0],cmap='gist_gray')


x52 = np.linspace( 1.18 ,1.4145 ,10)
y52 = np.linspace( 2.7409 , 3.0254,1000)
a52, b52 = np.meshgrid( x52 , y52 )
C52 =(a52-0.77)**2+(b52-2.45)**2-0.5
plt.contour(a52,b52,C52,[0],cmap='gist_gray')

x53 = np.linspace( 0.9301 ,1.0399 ,10)
y53 = np.linspace( 3.025 , 3.385,1000)
a53, b53 = np.meshgrid( x53 , y53 )
C53 =12*(a53-1.01)+np.arctan(5*(b53-3.1))
plt.contour(a53,b53,C53,[0],cmap='gist_gray')

x54 = np.arange(0.575, 0.843, 0.000001)
y54=-x54**2+0.8*x54-0.16+4.23
plt.plot(x54,y54,'k-')

x55 = np.linspace( 0.664 ,0.912 ,10)
y55 = np.linspace( 3.924 , 4.403,1000)
a55, b55 = np.meshgrid( x55 , y55 )
C55 =(a55-0.28)**2+(b55-3.9)**2-0.4
plt.contour(a55,b55,C55,[0],cmap='gist_gray')

y56 = np.arange(2.84, 3.04, 0.000001)
x56=y56*0+0.93
plt.plot(x56,y56,'k-')

x57 = np.arange(0.3, 0.7, 0.000001)
y57=-0.2*x57+3.02
plt.plot(x57,y57,'k-')

x572 = np.arange(0.817, 0.93, 0.000001)
y572=-0.2*x572+3.02
plt.plot(x572,y572,'k-')

x58 = np.linspace( 0.186 ,0.312 ,10)
y58 = np.linspace( 2.2816 , 2.9557,1000)
a58, b58 = np.meshgrid( x58 , y58 )
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C58 =(a58-0.12)**2+(b58-3.01)**2-0.04
plt.contour(a58,b58,C58,[0],cmap='gist_gray')

x59 = np.arange(0.186,0.407, 0.000001)
y59=-1.5*x59+3.1
plt.plot(x59,y59,'k-')

y60 = np.arange(2.3636,2.825, 0.000001)
x60=-1/1.6*y60+4.08/1.6
plt.plot(x60,y60,'k-')

x61 = np.linspace( 0.93 ,0.9715 ,10)
y61 = np.linspace( 2.7572 , 2.8394,1000)
a61, b61 = np.meshgrid( x61 , y61 )
C61 =b61+2*a61-4.7
plt.contour(a61,b61,C61,[0],cmap='gist_gray')

x612 = np.linspace( 1.0136 ,1.1 ,10)
y612 = np.linspace( 2.5 , 2.6728,1000)
a612, b612 = np.meshgrid( x612 , y612 )
C612 =b612+2*a612-4.7
plt.contour(a612,b612,C612,[0],cmap='gist_gray')

x62 = np.arange(0.407,0.714, 0.000001)
y62=1.2*x62+2
plt.plot(x62,y62,'k-')

y63 = np.arange(2.3636,2.5, 0.000001)
x63=1/5*y63+3/5
plt.plot(x63,y63,'k-')

y64 = np.arange(2.794,2.88, 0.000001)
x64=-1/1.6*y64+4/1.6
plt.plot(x64,y64,'k-')

y65 = np.arange(2.794,2.86, 0.000001)
x65=y65-2.04
plt.plot(x65,y65,'k-')

x67 = np.linspace( 0.1322 ,0.4137 ,10)
y67 = np.linspace( 3.863 , 3.954,1000)
a67, b67 = np.meshgrid( x67 , y67 )
C67 =(a67-0.13)*(-2.5*a67+1.29)+3.861-b67
plt.contour(a67,b67,C67,[0],cmap='gist_gray')

x68 = np.linspace( 0.13 ,0.365 ,10)
y68 = np.linspace( 0.25*x68+3.83 , 3.935 ,1000)
a68, b68 = np.meshgrid( x68 , y68 )
C68 = (a68-0.13)*(-2.5*a68+1.17)+3.86-b68
plt.contour(a68,b68,C68,[0],cmap='gist_gray')

x69 = np.linspace( 0.334 ,0.37 ,10)
y69 = np.linspace( 3.8 , 3.926 ,10)
a69, b69 = np.meshgrid( x69 , y69 )
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C69 = (a69+0.04)**2 + (b69-3.9)**2 -0.15
plt.contour(a69,b69,C69,[0],cmap='gist_gray')

x70 = np.linspace( 0.334 ,0.3766 ,10)
y70 = np.linspace( 3.8 , 3.924 ,10)
a70, b70 = np.meshgrid( x70 , y70 )
C70 =(a70-0.095)**2+(b70-3.95)**2-0.08
plt.contour(a70,b70,C70,[0],cmap='gist_gray')

x72 = np.linspace( 0.19 ,0.226,10)
y72 = np.linspace( 3.4, 3.907,1000)
a72,b72 = np.meshgrid( x72 , y72 )
C72 = 12*(a72-0.19) ** 2 + (b72-3.79 )** 2 - 0.015
plt.contour(a72,b72,C72,[0],cmap='gist_gray')

x722 = np.linspace( 0 ,0.19,10)
y722 = np.linspace( 3.5, 3.9,1000)
a722,b722 = np.meshgrid( x722 , y722 )
C722 = 12*(a722-0.19) ** 2 + (b722-3.79 )** 2 - 0.015
plt.contour(a722,b722,C722,[0],cmap='gist_gray')

x74 = np.linspace( 0.185 ,0.232 ,10)
y74 = np.linspace( 3.66 , 3.68 ,10)
a74, b74 = np.meshgrid( x74 , y74 )
C74 =(a74-0.14)**2+(b74-3.76)**2-0.015
plt.contour(a74,b74,C74,[0],cmap='gist_gray')

x75 = np.linspace( 0.185 ,0.232 ,10)
y75 = np.linspace( 3.66 , 3.68 ,10)
a75, b75 = np.meshgrid( x75 , y75 )
C75 =(a75-0.15)**2+(b75-3.77)**2-0.015
plt.contour(a75,b75,C75,[0],cmap='gist_gray')

x76 = np.arange(0.11,0.17, 0.000001)
y76=-2.5*x76**2+1.615*x76+3.7323
plt.plot(x76,y76,'k-')

x77 = np.arange(0.05,0.27, 0.000001)
y77=-1.2*x77**2+1.35*x77+3.7955
plt.plot(x77,y77,'k-')

x78 = np.arange(0.05,0.3, 0.000001)
y78=-1.2*x78**2+1.56*x78+3.785
plt.plot(x78,y78,'k-')

x79 = np.linspace( -0.0257 ,-0.017 ,10)
y79 = np.linspace( 3.592 , 3.727 ,10)
a79, b79 = np.meshgrid( x79 , y79 )
C79 =20*(a79+0.04)**2+(b79-3.65)**2-0.01
plt.contour(a79,b79,C79,[0],cmap='gist_gray')

x799 = np.linspace( -0.0607 ,-0.0471 ,10)
y799 = np.linspace( 3.668 , 3.745 ,10)
a799, b799 = np.meshgrid( x799 , y799 )
```

```
C799 =20*(a799+0.04)**2+(b799-3.65)**2-0.01
plt.contour(a799,b799,C799,[0],cmap='gist_gray')

x82 = np.arange(-0.078,-0.03, 0.000001)
y82=-1.2*x82**2-1.5*x82+3.75
plt.plot(x82,y82,'k-')

x83 = np.linspace( -0.08 ,-0.01 ,10)
y83 = np.linspace( 3.65 , 3.8 ,10)
a83, b83 = np.meshgrid( x83 , y83 )
C83 =(a83+0.1)**2+(b83-3.68)**2-0.01
plt.contour(a83,b83,C83,[0],cmap='gist_gray')

x84 = np.linspace( -0.08 ,-0.01 ,10)
y84 = np.linspace( 3.65 , 3.8 ,10)
a84, b84 = np.meshgrid( x84 , y84 )
C84 =(a84+0.1)**2+(b84-3.66)**2-0.01
plt.contour(a84,b84,C84,[0],cmap='gist_gray')

x85 = np.linspace( 0.7512 , 0.7832 ,10)
y85 = np.linspace( 2.693 , 2.798 ,10)
a85, b85 = np.meshgrid( x85 , y85 )
C85 =70*(a85-0.77)+np.arctan(50*(b85-2.72))
plt.contour(a85,b85,C85,[0],cmap='gist_gray')

x86 = np.linspace( 0.7832 , 0.86 ,10)
y86 = np.linspace( 2.458 , 2.693 ,10)
a86, b86 = np.meshgrid( x86 , y86 )
C86 =30*(a86-0.83)+np.arctan(30*(b86-2.5))
plt.contour(a86,b86,C86,[0],cmap='gist_gray')

y87 = np.arange(2.069,2.458, 0.000001)
x87=-1/4.7*y87+6.5/4.7
plt.plot(x87,y87,'k-')

x88 = np.arange(0.51,0.955, 0.000001)
y88=0.1*x88**2-1.4*x88+4.9-1.6
plt.plot(x88,y88,'k-')

x89 = np.arange(0.455,0.9735, 0.000001)
y89=-0.4*x89**2-0.56*x89-0.196+3.08
plt.plot(x89,y89,'k-')

x90 = np.linspace( 0.955 , 1 ,10)
y90 = np.linspace( 2.0537 , 2.498 ,10)
a90, b90 = np.meshgrid( x90 , y90 )
C90 =(a90-0)**2+(b90-2.35)**2 - 1
plt.contour(a90,b90,C90,[0],cmap='gist_gray')

x91 = np.linspace( 0.9735 , 1.0488 ,10)
y91 = np.linspace( 1.96 , 2.404 ,10)
a91, b91 = np.meshgrid( x91 , y91 )
C91 =(a91-0)**2+(b91-2.35)**2 - 1.1
plt.contour(a91,b91,C91,[0],cmap='gist_gray')
```

```
x92 = np.linspace( -0.1 , 0.192 ,10)
y92 = np.linspace( 2.75 , 2.971 ,10)
a92, b92 = np.meshgrid( x92 , y92 )
C92 =(a92+0.12)**2+(b92-2.64)**2-0.11
plt.contour(a92,b92,C92,[0],cmap='gist_gray')

x93 = np.linspace( -0.2 ,0.125 )
y93 = np.linspace( 2.3167 , 3.0069 )
a93 ,  b93 = np.meshgrid( x93 , y93 )
C93 = 5*(a93+0.2) ** 2 + (b93-2.3 )** 2 - 0.5
plt.contour(a93,b93,C93,[0],cmap='gist_gray')

x94 = np.linspace( -0.22,0.145 )
y94 = np.linspace( 1.8603,3.0045 )
a94 , b94 = np.meshgrid( x94 , y94 )
C94 = 6*(a94+0.22) ** 2 + (b94-2.43 )** 2 - 0.33
plt.contour(a94,b94,C94,[0],cmap='gist_gray')

x95 = np.linspace( -0.181,0.125 )
y95 = np.linspace( 1.699,2.32 )
a95 , b95 = np.meshgrid( x95 , y95 )
C95 = 4*(a95+0.2) ** 2 + (b95-2.33 )** 2 - 0.4
plt.contour(a95,b95,C95,[0],cmap='gist_gray')

x96 = np.linspace( -0.3834,-0.1818 )
y96 = np.linspace( 1.6991,2.03 )
a96 , b96 = np.meshgrid( x96 , y96 )
C96 = 4*(a96+0.1) ** 2 + (b96-2.31 )** 2 - 0.4
plt.contour(a96,b96,C96,[0],cmap='gist_gray')

x97 = np.arange(0.1422,0.1917, 0.000001)
y97=-0.4*x97+2.9
plt.plot(x97,y97,'k-')

x98 = np.linspace( -0.3107,-0.19 )
y98 = np.linspace( 1.8603,1.9896 )
a98 , b98 = np.meshgrid( x98 , y98 )
C98 = 6*(a98+0.16) ** 2 + (b98-2.43 )** 2 - 0.33
plt.contour(a98,b98,C98,[0],cmap='gist_gray')

x99 = np.arange(-0.6,-0.2, 0.000001)
y99=-0.52*x99+1.83
plt.plot(x99,y99,'k-')

x100 = np.arange(-0.59,0.008, 0.000001)
y100=0.45*x100**2-0.738*x100+2.30258
plt.plot(x100,y100,'k-')

x101 = np.arange(-0.43,0, 0.000001)
y101=2.63-0.52*x101
plt.plot(x101,y101,'k-')

x102 = np.linspace( -0.174,0 )
```

```
y102 = np.linspace( 2.1025,2.993 )
a102 , b102 = np.meshgrid( x102 , y102 )
C102 = (b102+2.6*a102-2.55)*(b102-3*a102-2.5)+0.01
plt.contour(a102,b102,C102,[0],cmap='gist_gray')

x103 = np.linspace( -0.27308,-0.1374 )
y103 = np.linspace( 1.972,2.1017 )
a103 , b103 = np.meshgrid( x103 , y103 )
C103 = 5*(a103+0.28) ** 2 + (b103-2.43 )** 2 - 0.21
plt.contour(a103,b103,C103,[0],cmap='gist_gray')

x104 = np.arange(-0.4885,-0.2, 0.000001)
y104=-1.2*(x104+0.3)**2+3.01
plt.plot(x104,y104,'k-')

x105 = np.arange(-0.6236,-0.444, 0.000001)
y105=-6*(x105+0.55)**2+2.99
plt.plot(x105,y105,'k-')

x106 = np.arange(-0.983,-0.581, 0.000001)
y106=-2*(x106+0.85)**2+3.06
plt.plot(x106,y106,'k-')

x107 = np.arange(-1.113,-0.42, 0.000001)
y107=2.1+0.12*x107
plt.plot(x107,y107,'k-')

x108 = np.linspace( 0.01,0.1645 )
y108 = np.linspace( 2.8342,3.181 )
a108 , b108 = np.meshgrid( x108 , y108 )
C108 = (a108-0.41) ** 2 + (b108-3.15 )** 2 - 0.16
plt.contour(a108,b108,C108,[0],cmap='gist_gray')

x109 = np.arange(0.111,0.1655, 0.000001)
y109=3.33-3*x109
plt.plot(x109,y109,'k-')

x110 = np.arange(0.111,0.236, 0.000001)
y110=3.13-1.2*x110
plt.plot(x110,y110,'k-')

x111 = np.arange(-0.8812,-0.6438, 0.000001)
y111=-5.5*x111**2-9.9*x111-1.395
plt.plot(x111,y111,'k-')

y112 = np.arange(2.09,2.699, 0.000001)
a112=np.arctan(5*(y112-2.4))
x112=1/5*a112-4.2/5
plt.plot(x112,y112,'k-')

x113 = np.linspace( -1.28,-1.097 )
y113 = np.linspace( 1.9844,2.6239 )
a113 , b113 = np.meshgrid( x113 , y113 )
C113 = 7*(a113+1.06) ** 2 + (b113-2.55 )** 2 - 0.33
```

```
plt.contour(a113,b113,C113,[0],cmap='gist_gray')

x114 = np.linspace( -1.0966,-1.0383 )
y114 = np.linspace( 1.984,2.0942 )
a114 , b114 = np.meshgrid( x114 , y114 )
C114 = 7*(a114+1.192) ** 2 + (b114-2.5 )** 2 - 0.33
plt.contour(a114,b114,C114,[0],cmap='gist_gray')

x115 = np.arange(-1.489,-0.82, 0.000001)
y115=2.05-0.45*x115
plt.plot(x115,y115,'k-')

x116 = np.arange(-1.25,-0.76, 0.000001)
y116=2.71-0.32*x116
plt.plot(x116,y116,'k-')

x117 = np.arange(-2.686,-1.25, 0.000001)
y117=-0.1*(x117+2.25)**3+0.1*(x117+2.25)+2.71-0.32*x117
plt.plot(x117,y117,'k-')

x118 = np.arange(-3.719,-2.686, 0.000001)
y118=-1/10*0.9*(x118+3.09)**2-1/10*np.arctan(5*(x118+3.09))+3.66
plt.plot(x118,y118,'k-')

x119 = np.arange(-3.858,-3.719, 0.000001)
y119=2*(x119+3.7)**2+3.75
plt.plot(x119,y119,'k-')

x120 = np.linspace( -3.99,-3.858)
y120 = np.linspace( 3.73, 3.9)
a120 , b120 = np.meshgrid( x120 , y120 )
C120 = (a120+3.89) ** 2 + (b120-3.731 )** 2 - 0.00582
plt.contour(a120,b120,C120,[0],cmap='gist_gray')

x121 = np.arange(-3.075,-1.489, 0.000001)
y121=0.5/20*(x121+2.2)**2-1/20*np.arctan(5*(x121+2.2))-5/20*x121+2.4
plt.plot(x121,y121,'k-')

x122 = np.linspace( -3.966,-3.6 )
y122 = np.linspace( 3.612,3.725 )
a122 , b122 = np.meshgrid( x122 , y122 )
C122 = (a122+3.65) ** 2 + 7*(b122-3.73 )** 2 - 0.1
plt.contour(a122,b122,C122,[0],cmap='gist_gray')

x123 = np.arange(-3.689,-3.25, 0.000001)
y123=1.15*(x123+3.25)**2+3.39
plt.plot(x123,y123,'k-')

x124 = np.arange(-3.38,-3.075, 0.000001)
y124=0.9*(x124+3.4)**2+3.16
plt.plot(x124,y124,'k-')

x125 = np.arange(-3.96,-3.654, 0.000001)
y125=0.5*(x125+4.5)**2+3.22
```

```
plt.plot(x125,y125,'k-')

x126 = np.arange(-4.32,-3.96, 0.000001)
y126=0.9*x126+6.93
plt.plot(x126,y126,'k-')

x127 = np.linspace( -4.4,-4.23 )
y127 = np.linspace( 2.97,3.0474 )
a127 , b127 = np.meshgrid( x127 , y127 )
C127 = (a127+4.255) ** 2 + 2*(b127-3.025 )** 2 - 0.0045
plt.contour(a127,b127,C127,[0],cmap='gist_gray')

x128 = np.arange(-4.23,-3.936, 0.000001)
y128=0.78*x128+6.28
plt.plot(x128,y128,'k-')

x129 = np.arange(-3.936,-3.83, 0.000001)
y129=0.5*x129+5.178
plt.plot(x129,y129,'k-')

x130 = np.linspace( -3.832,-3.673 )
y130 = np.linspace( 3.242,3.33 )
a130 , b130 = np.meshgrid( x130 , y130 )
C130 = 0.5*(a130+3.725) ** 2 + (b130-3.245 )** 2 - 0.00582
plt.contour(a130,b130,C130,[0],cmap='gist_gray')

x131 = np.linspace( -3.85,-3.77 )
y131 = np.linspace( 3.1088,3.25 )
a131 , b131 = np.meshgrid( x131 , y131 )
C131 = (a131+3.77) ** 2 + 0.6*(b131-3.2 )** 2 - 0.005
plt.contour(a131,b131,C131,[0],cmap='gist_gray')

x132 = np.linspace( -3.772,-3.472 )
y132 = np.linspace( 3.109,3.414 )
a132 , b132 = np.meshgrid( x132 , y132 )
C132 = (b132 - 0.3*a132 - 4.24)*(b132 - 2.3*a132 - 11.4) - 0.0001
plt.contour(a132,b132,C132,[0],cmap='gist_gray')

x133 = np.arange(-3.712,-3.472, 0.000001)
y133=-4.8*(x133+3.52)**2+3.425
plt.plot(x133,y133,'k-')

x134 = np.arange(-3.71,-3.595, 0.000001)
y134=0.5*(x134+3.32)**2+3.36
plt.plot(x134,y134,'k-')

x135 = np.linspace( -3.648,-3.425 )
y135 = np.linspace( 3.0376,3.355 )
a135 , b135 = np.meshgrid( x135 , y135 )
C135 = (8.5*(a135+3.82) - b135)*(0.5*a135 - b135 +4.86)-0.001
plt.contour(a135,b135,C135,[0],cmap='gist_gray')

x136=np.linspace(-3.751,-3.64)
y136=np.linspace(3.02,3.12)
```

```
a136,b136=np.meshgrid(x136,y136)
c136=(a136+3.67)**2+1.5*(b136-3.1)**2-0.0065
plt.contour(a136,b136,c136,[0],cmap='gist_gray')

x137=np.linspace(-3.495,-3.4)
y137=np.linspace(3.361,3.4)
a137,b137=np.meshgrid(x137,y137)
c137=1.5*(a137+3.46)**2+(b137-3.315)**2-0.004
plt.contour(a137,b137,c137,[0],cmap='gist_gray')

x138=np.linspace(-3.631,-3.535)
y138=np.linspace(2.8,3.0455)
a138,b138=np.meshgrid(x138,y138)
c138=(a138+3.56)**2+1.5*(b138-3.04)**2-0.005
plt.contour(a138,b138,c138,[0],cmap='gist_gray')

x139=np.linspace(-3.544,-3.365)
y139=np.linspace(2.9843,3.293)
a139,b139=np.meshgrid(x139,y139)
c139=(9*(a139+3.73)-b139)*(0.5*a139-b139+4.755)-0.001
plt.contour(a139,b139,c139,[0],cmap='gist_gray')

x140=np.linspace(-3.433,-3.366)
y140=np.linspace(3.293,3.315)
a140,b140=np.meshgrid(x140,y140)
c140=1.5*(a140+3.4)**2+(b140-3.26)**2-0.003
plt.contour(a140,b140,c140,[0],cmap='gist_gray')

x141 = np.arange(-3.465,-3.356, 0.000001)
y141=1.15*(x141+3.0)**2+3.29
plt.plot(x141,y141,'k-')

x142 = np.arange(1.093,1.27, 0.000001)
y142=3.23-0.7*x142
plt.plot(x142,y142,'k-')

y143 = np.arange(2.098,2.377, 0.000001)
x143=1/20*y143+1.1
plt.plot(x143,y143,'k-')

y144 = np.arange(2.0124,2.344, 0.000001)
x144=1/20*y144+1.153
plt.plot(x144,y144,'k-')

x145=np.linspace(1.2673,1.399)
y145=np.linspace(1.9461,2.2851)
a145,b145=np.meshgrid(x145,y145)
c145=(a145-0.95)**2+(b145-1.97)**2-0.2
plt.contour(a145,b145,c145,[0],cmap='gist_gray')

y146 = np.arange(2.035,2.2262, 0.000001)
x146=1/4*y146+0.76
plt.plot(x146,y146,'k-')
```

```
x147=np.linspace(1.255,1.4437)
y147=np.linspace(1.825,2.39)
a147,b147=np.meshgrid(x147,y147)
c147=(a147-1.2)**2+(b147-1.8)**2-0.06
plt.contour(a147,b147,c147,[0],cmap='gist_gray')

x148=np.linspace(1.099,1.319)
y148=np.linspace(1.38,2.28)
a148,b148=np.meshgrid(x148,y148)
c148=(4.15-1.7*a148-b148)*(20*(a148-1.23)-b148)+0.01
plt.contour(a148,b148,c148,[0],cmap='gist_gray')

x149=np.linspace(1.4,1.5926)
y149=np.linspace(1.5343,1.88)
a149,b149=np.meshgrid(x149,y149)
c149=(a149-0.64)**2+(b149-1.23)**2-1
plt.contour(a149,b149,c149,[0],cmap='gist_gray')

x150 = np.arange(1.3062,1.5926, 0.000001)
y150=-4.5*(x150-1.443)**2+1.635
plt.plot(x150,y150,'k-')

x151=np.linspace(1.5174,1.6232)
y151=np.linspace(1.5343,1.2905)
a151,b151=np.meshgrid(x151,y151)
c151=(a151-1.45)**2+(b151-1.45)**2-0.03
plt.contour(a151,b151,c151,[0],cmap='gist_gray')

x152=np.linspace(1.458,1.5174)
y152=np.linspace(1.1,1.285)
a152,b152=np.meshgrid(x152,y152)
c152=0.5*(a152-1.44)**2+(b152-1.33)**4-0.003
plt.contour(a152,b152,c152,[0],cmap='gist_gray')

x153 = np.arange(1.3018,1.3648, 0.000001)
y153=-7*(x153-1.51)
plt.plot(x153,y153,'k-')

x1532 = np.arange(1.4578,1.4677, 0.000001)
y1532=-7*(x1532-1.51)
plt.plot(x1532,y1532,'k-')

y154 = np.arange(-0.0776,1.6152, 0.000001)
x154=-1/20*np.arctan(10*(y154-0.92))-1/20*2.5*y154+1/20*1.3*(abs(y154-0.9)-(y154-0.9))+1.65
plt.plot(x154,y154,'k-')

x155 = np.arange(1,1.44, 0.000001)
y155=-1.6*x155+3.2
plt.plot(x155,y155,'k-')

x156 = np.arange(1.44,1.5556, 0.000001)
y156=-1.6*x156+3.05
plt.plot(x156,y156,'k-')
```

```
y157 = np.arange(0.745,0.9, 0.000001)
x157=y157*0+1.44
plt.plot(x157,y157,'k-')

x158 = np.arange(1.4578,1.5556, 0.000001)
y158=2*x158-2.55
plt.plot(x158,y158,'k-')

x159 = np.arange(-0.2105,1.536, 0.000001)
y159=-0.29*(x159-0.69)**2+0.73
plt.plot(x159,y159,'k-')

x160 = np.arange(-0.2296,-0.2105, 0.000001)
y160=10*(x160+0.26)
plt.plot(x160,y160,'k-')

x161 = np.arange(-0.2296,1.468, 0.000001)
y161=-0.25*(x161-0.61)**2+0.48
plt.plot(x161,y161,'k-')

x162=np.linspace(0.8966,0.99)
y162=np.linspace(1.7224,1.9743)
a162,b162=np.meshgrid(x162,y162)
c162=(a162-0.29)**2+(b162-1.9)**2-0.4
plt.contour(a162,b162,c162,[0],cmap='gist_gray')

y163 = np.arange(0.395,0.5139, 0.000001)
x163=6*(y163-0.53)**2-0.33
plt.plot(x163,y163,'k-')

y164 = np.arange(0.5139,1.0334, 0.000001)
x164=1/13*np.arctan(12*(y164-0.7))-0.24
plt.plot(x164,y164,'k-')

y165 = np.arange(1.0334,1.265, 0.000001)
x165=1/0.7*y165-1.13/0.7
plt.plot(x165,y165,'k-')

y166 = np.arange(1.107,1.7, 0.000001)
x166=-1/20*np.arctan(10*(y166-1.28))-1/20*y166-0.03
plt.plot(x166,y166,'k-')

y167 = np.arange(1.595,1.8018, 0.000001)
x167=1/3*y167-1/3*1.88
plt.plot(x167,y167,'k-')

x168=np.linspace(1.466,2.254)
y168=np.linspace(-0.7877,0.29649)
a168,b168=np.meshgrid(x168,y168)
c168=(a168-0.135)**2+(b168+1.5)**2-5
plt.contour(a168,b168,c168,[0],cmap='gist_gray')

x169=np.linspace(-0.745,-0.23)
y169=np.linspace(-1.0817,0.3131)
```

```
a169,b169=np.meshgrid(x169,y169)
c169=1.8*(a169-0.135)**2+(b169+0.75)**2-1.37
plt.contour(a169,b169,c169,[0],cmap='gist_gray')

x170 = np.arange(-0.702,-0.269, 0.000001)
y170=x170-0.38
plt.plot(x170,y170,'k-')

y171 = np.arange(-0.6486,0.28, 0.000001)
x171=1/8*y171-1/8*1.5
plt.plot(x171,y171,'k-')

x172 = np.arange(-0.695,-0.5198, 0.000001)
y172=-1.77-x172
plt.plot(x172,y172,'k-')

y173 = np.arange(-0.9552,-0.78, 0.000001)
x173=y173*0-0.4
plt.plot(x173,y173,'k-')

x174 = np.arange(-0.4,0.6688, 0.000001)
y174=1/5*np.arctan(4*(x174-0.2))-0.72
plt.plot(x174,y174,'k-')

x175 = np.arange(0.2664,0.6688, 0.000001)
y175=2*(x175-0.47)*(-0.4*x175-1)
plt.plot(x175,y175,'k-')

x176 = np.arange(0.4738,0.6625, 0.000001)
y176=-1.3+1.2*x176
plt.plot(x176,y176,'k-')

y177 = np.arange(-0.7448,-0.575, 0.000001)
x177=-1/3*y177+1/3*0.69
plt.plot(x177,y177,'k-')

x178 = np.arange(0.478,1.5237, 0.000001)
y178=1/8*np.arctan(4*(x178-1.05))-0.6
plt.plot(x178,y178,'k-')

x179=np.linspace(0.9465,1.523)
y179=np.linspace(-0.4643,0.4512)
a179,b179=np.meshgrid(x179,y179)
c179=(a179+0.5)**2+(b179+1.1)**2-4.5
plt.contour(a179,b179,c179,[0],cmap='gist_gray')

x180 = np.arange(1.41,1.5164, 0.000001)
y180=-2.3+1.21*x180
plt.plot(x180,y180,'k-')

y181 = np.arange(-0.5939,-0.4795, 0.000001)
x181=y181*0+1.41
plt.plot(x181,y181,'k-')
```

```
x182=np.linspace(1.4105,2.2546)
y182=np.linspace(-0.5283,-0.787)
a182,b182=np.meshgrid(x182,y182)
c182=(0.2*a182-0.865-b182)*(2.17-1.3*a182-b182)-0.01
plt.contour(a182,b182,c182,[0],cmap='gist_gray')

x183=np.arange(-0.496,-0.4915,0.000001)
y183=-270.583333333333333*x183-135.193966667
plt.plot(x183,y183,'k-')

y184 = np.arange(-3.8,-2.176, 0.000001)
x184=1/6*np.arctan(1.7*(y184+3))-0.65
plt.plot(x184,y184,'k-')

y185 = np.arange(-2.75,-0.7406, 0.000001)
x185=1/6*np.arctan(1.7*(y185+1.5))+0.375
plt.plot(x185,y185,'k-')

y186 = np.arange(-3.8,-2.75, 0.000001)
x186=1/18*np.arctan(8*(y186+3))+0.125
plt.plot(x186,y186,'k-')

y187 = np.arange(-2.957,-0.694, 0.000001)
x187=-1/3.5*y187+2.16/3.5
plt.plot(x187,y187,'k-')

x188=np.arange(1.7844,2.0909,0.000001)
y188=-8.67830342577*x188+14.951464633
plt.plot(x188,y188,'k-')

x189 = np.linspace( 0 ,5 ,1000)
y189 = np.linspace( -4, -2.9568,1000)
a189, b189 = np.meshgrid( x189 , y189 )
C189 = (a189-4.62)**2+(b189+3.12 )**2-10
plt.contour(a189,b189,C189,[0],cmap='gist_gray')


x190=np.arange(2.0909,2.378,0.000001)
y190=-2.7969348659*x190+2.6541111111
plt.plot(x190,y190,'k-')

y191=np.arange(-3.12,-2.9,0.000001)
x191=-1/2.8*y191-3.95/2.8
plt.plot(x191,y191,'k-')

x192=np.arange(1.64,1.8,0.000001)
y192=-0.25-1.7*x192
plt.plot(x192,y192,'k-')

x193=np.arange(0.4458,0.9353,0.000001)
y193=1/20*np.arctan(12*(x193-0.6))-1.18
plt.plot(x193,y193,'k-')

x194=np.arange(1.7911,2.107,0.000001)
```

```
y194=1.49-1.15*x194
plt.plot(x194,y194,'k-')

x195=np.arange(2.107,2.2535,0.000001)
y195=-3.04+x195
plt.plot(x195,y195,'k-')

x196=np.arange(2.107,2.2255,0.000001)
y196=-0.6*(x196-2.107)-0.933
plt.plot(x196,y196,'k-')

x197=np.arange(1.9056,2.2255,0.000001)
y197=-2.74+0.78*x197
plt.plot(x197,y197,'k-')

y198=np.arange(-1.004,-0.8318,0.000001)
x198=-1/10*y198+2.125
plt.plot(x198,y198,'k-')

x199 = np.linspace( 2.0074 ,2.18 ,1000)
y199 = np.linspace( -1.2 , -1.0454,1000)
a199, b199 = np.meshgrid( x199 , y199 )
C199 = (a199-2.18)*(b199+1.18 )+ 0.001
plt.contour(a199,b199,C199,[0],cmap='gist_gray')

x200 = np.linspace( 1.912 ,2.1317 ,1000)
y200 = np.linspace( -1.2956 , -1.178)
a200, b200 = np.meshgrid( x200 , y200 )
C200 = (a200-2.14)*(b200+1.3 )+ 0.001
plt.contour(a200,b200,C200,[0],cmap='gist_gray')

x201 = np.linspace( 1.9245 ,2.09 )
y201 = np.linspace( -1.3839 , -1.2832)
a201, b201 = np.meshgrid( x201 , y201 )
C201 = (a201-2.09)*(b201+1.39 )+ 0.001
plt.contour(a201,b201,C201,[0],cmap='gist_gray')

x206 = np.linspace( 1.1248 ,1.2252 )
y206 = np.linspace( 2.0525 , 2.0625)
a206, b206 = np.meshgrid( x206 , y206 )
C206 = 0.1*(a206-1.2)+2.06-b206
plt.contour(a206,b206,C206,[0],cmap='Reds')

x207 = np.linspace( 1.1248 ,1.137 )
y207 = np.linspace( 1.93 , 2.0525)
a207, b207 = np.meshgrid( x207 , y207 )
C207 = -10*(a207-1.13)+2-b207
plt.contour(a207,b207,C207,[0],cmap='Reds')

x208 = np.linspace( 1.248 ,1.2566 )
y208 = np.linspace( 1.934, 2.02)
a208, b208 = np.meshgrid( x208 , y208 )
C208 =-10*(a208-1.25)+2-b208
plt.contour(a208,b208,C208,[0],cmap='Reds')
```

```
x209 = np.linspace( 1.1375 ,1.1996 )
y209 = np.linspace( 1.9002 , 1.925)
a209, b209 = np.meshgrid( x209 , y209 )
C209 = -0.4*(a209-1.2)+1.9-b209
plt.contour(a209,b209,C209,[0],cmap='Reds')

x210 = np.linspace( 1.2005 ,1.2566 )
y210 = np.linspace( 1.9003 , 1.934)
a210, b210 = np.meshgrid( x210 , y210 )
C210 = 0.6*(a210-1.2)+1.9-b210
plt.contour(a210,b210,C210,[0],cmap='Reds')

x211 = np.linspace( 1.1682  ,1.2203 )
y211 = np.linspace( 1.9277 , 1.9604)
a211, b211 = np.meshgrid( x211 , y211 )
C211 = (a211-1.1946)**2+(b211-1.95415)**2-0.0007
plt.contour(a211,b211,C211,[0],cmap='Oranges')

x212 = np.linspace( 1.1629  ,1.215 )
y212 = np.linspace( 2.0079 , 2.0406)
a212, b212 = np.meshgrid( x212 , y212 )
C212 =(a212-1.1886)**2+(b212-2.01415)**2-0.0007
plt.contour(a212,b212,C212,[0],cmap='Oranges')

x213 = np.linspace( 1.1352 ,1.1682 )
y213 = np.linspace( 1.9547 , 2.0076)
a213, b213 = np.meshgrid( x213 , y213 )
C213 =(a213-1.1616)**2+(b213-1.98115)**2-0.0007
plt.contour(a213,b213,C213,[0],cmap='Oranges')

x214 = np.linspace( 1.2153 ,1.248 )
y214 = np.linspace( 1.9607 , 2.0136)
a214, b214 = np.meshgrid( x214 , y214 )
C214 =(a214-1.2216)**2+(b214-1.98715)**2-0.0007
plt.contour(a214,b214,C214,[0],cmap='Oranges')

y217=np.arange(1.6,5.6,0.000001)
x217=-1*(y217-3.6)**2+-4.25
plt.plot(x217,y217,'r-')

y218=np.arange(1.6,5.6,0.000001)
x218=-1/0.48*(y218-3.6)**2+-2.1024/0.48
plt.plot(x218,y218,'r-')

y219=np.arange(1.6,5.6,0.000001)
x219=-1/0.24*(y219-3.6)**2+-1.0656/0.24
plt.plot(x219,y219,'r-')

y220=np.arange(1.6,5.6,0.000001)
x220=-1/0.12*(y220-3.6)**2+-0.5364/0.12
plt.plot(x220,y220,'-',color='orange')

y221=np.arange(1.6,5.6,0.000001)
```

```
x221=-1/0.08*(y221-3.6)**2+-0.3584/0.08
plt.plot(x221,y221,'-',color='orange')

y222=np.arange(1.6,5.6,0.000001)
x222=-1/0.06*(y222-3.6)**2+-0.2691/0.06
plt.plot(x222,y222,'-',color='orange')

y223=np.arange(1.6,5.6,0.000001)
x223=-1/0.04*(y223-3.6)**2+-0.1796/0.04
plt.plot(x223,y223,'-',color='orange')



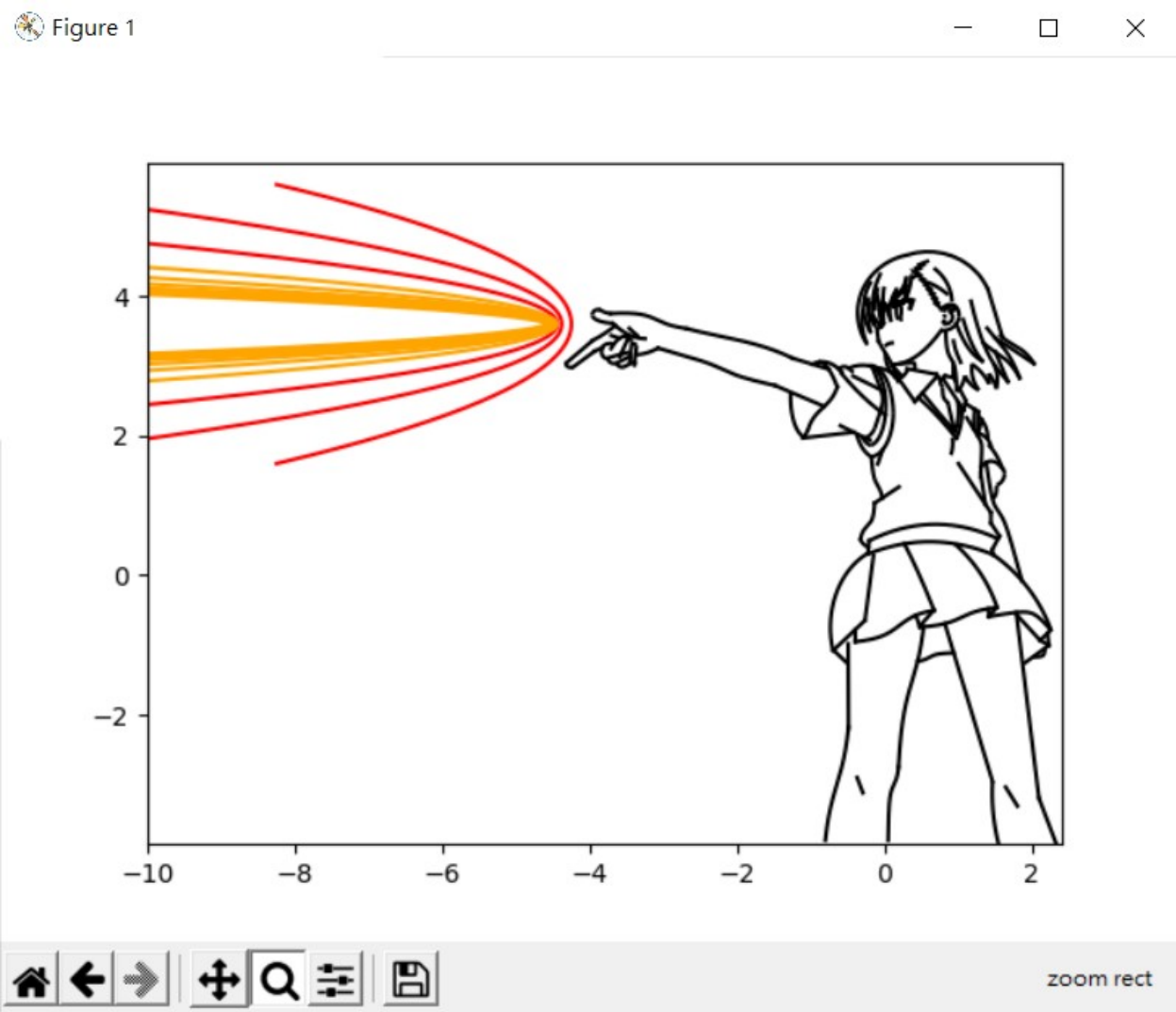






plt.xlim(-10,15)
plt.ylim(-5,10)
plt.show()
```

code結果



參考資料

https://www.desmos.com/calculator/stx9gku22c?lang=zh-TW