```
import matplotlib.pyplot as plt
import mpmath as mp
from mpmath import zeta,exp

epsilon1 = 0.1
epsilon2 = 0.02

#mp.cplot(lambda z:zeta(z),[-0.5,1.5],[-50,50])

def zetaalternee(s):
    somme = 0
    n = 1
    pastroppetit = True
    while pastroppetit:
        terme = ((-1)**(n-1))/(n**s)
        somme = somme+terme
        pastroppetit = (terme.real*terme.real+terme.imag*terme.imag > epsilon2)
        n = n+1
    #return(somme/(1-(2**(1-s))))
    return(somme)

fig, axs = plt.subplots(2)

lesx = [] ; lesy = [] ; lesz = [] ; lest = [] ; lesu = []
x = 0
for t in range(1000):
    x = x+t*0.0002
    lesx.append(x)
    y = zeta(0.5+1j*x).real ; z = zeta(0.5+1j*x).imag
    t = (1/(1-2**(1-(0.5+1j*x))))*zetaalternee(0.5+1j*x).real ; u = (1/(1-2**(1-
(0.5+1j*x))))*zetaalternee(0.5+1j*x).imag
    lesy.append(y) ; lesz.append(z)
    lest.append(t) ; lesu.append(u)
    if abs(y) < epsilon1 and abs(y-z) < epsilon1:
        print(x,' real = imag.')
        axs[0].scatter(x,0,color='violet')
    if abs(t) < epsilon1 and abs(t-u) < epsilon1:
        print(x,' real = imag.')
        axs[1].scatter(x,0,color='brown')

axs[0].plot(lesx,lesy,label='Re',color='blue',alpha=0.5)
axs[0].plot(lesx,lesz,label='Im',color='red',alpha=0.5)
axs[0].set_xticks(range(0,100,5))
axs[0].grid()
axs[0].legend()

axs[1].plot(lesx,lesu,label='alternee Re',color='green',alpha=0.5)
axs[1].plot(lesx,lest,label='alternee Im',color='black',alpha=0.5)
axs[1].set_xticks(range(0,100,5))
axs[1].grid()
axs[1].legend()
plt.show()
```