

Ejercicio5_4

May 27, 2020

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[1]: from numpy import sin, cos, zeros, linspace
from pylab import imshow, show, plot, title
from math import pi, sqrt

print('Librerias')
```

Librerias

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[2]: def f(x,m,th):
    return cos(m*th - x*sin(th))

n = 1000
a = 0
b = pi
h = (b - a)/n

j = zeros([21,3],float)
p = []
for pnt in range(21): #Puntos del Eje X
    p.append(pnt)

for m in range(3): #Variacion de la matriz para J0, J1 y J2

    for x in range(21): #Variacion de la matriz para X de 0 a 20

        s = f(x,m,a) + f(x,m,b)

        for k in range(1, n, 2):
            s+=(4*f(x,m,a+(k*h)))

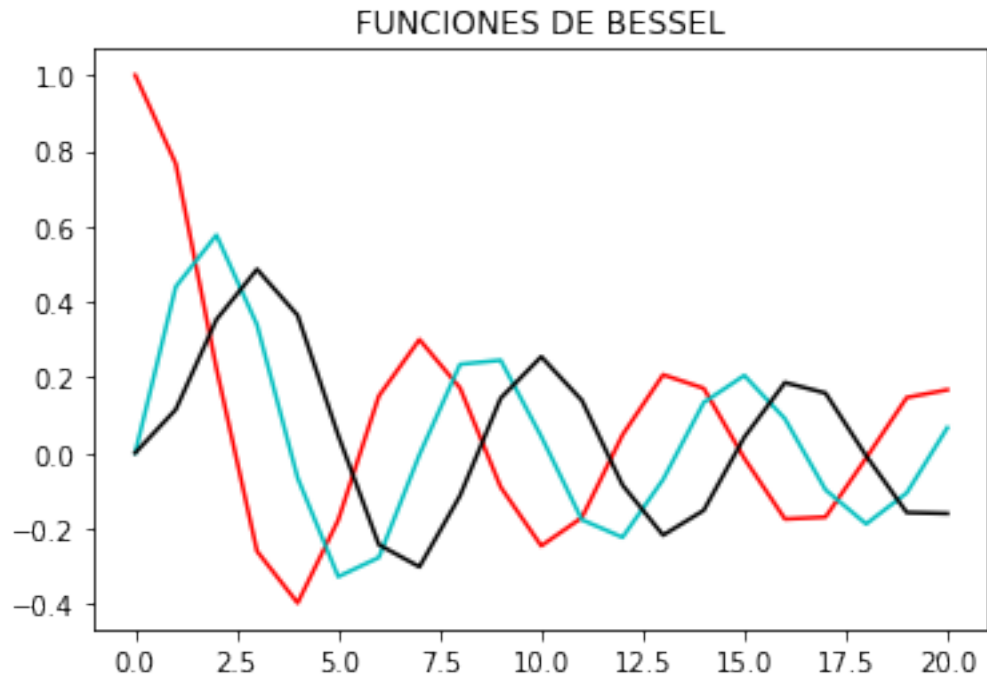
        for i in range(2,n,2):
            s+=(2*f(x,m,a+(i*h)))

        s =(h*s)/(3*pi)
        j[x,m] = s #Valores para cada función de Bessel en X
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plot(p,j[:,0], '-r')
plot(p,j[:,1], '-c')
plot(p,j[:,2], '-k')
title('FUNCIONES DE BESSEL')
show()

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[3]: def f(kr,th):
      return cos(th - kr*sin(th))

n = 200
a = 0
b = pi
h = (b - a)/n

la = 500e-9 #Longitud de onda
kp = (2*pi)/la #Constante k

rx = linspace(-1e-6, 1e-6, n) #Coordenadas X de los pixeles
ry = linspace(-1e-6, 1e-6, n) #Coordenadas y de los pixeles

I = zeros([n, n], float)

for y in range(n):
    for x in range(n):
        r = sqrt(rx[x]**2 + ry[y]**2) #Variación del radio

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kr = kp*r
j1 = f(kr, a)+f(kr, b)

for k in range(1, n, 2):
    j1+=(4*f(kr, a+(k*h)))

for i in range(2, n, 2):
    j1+=(2*f(kr, a+(i*h)))

j1 = (h*j1)/(3*pi)

if kr == 0:
    I[x,y] = (1/2)**2 #Condicional para punto central
else:
    I[x,y] = (j1/kr)**2

imshow(I, cmap="gray", vmax=0.005)

```

[3]: <matplotlib.image.AxesImage at 0x7f7bf1ed6f28>

