xMin=0;xMax=10;

yMin=0;yMax=10;

xDelta=xMax-xMin;

yDelta=yMax-yMin;%rectangle dimensions

areaTotal=xDelta\*yDelta;

%Point process parametes

lambda=3; %intensity (ie mean density) of the Poisson process

%Simulate Poisson point process

numbPoints=poissrnd(areaTotal\*lambda);%Poisson number of points

xx=xDelta\*(rand(numbPoints,1)) +xMin;%x coordinates of Poisson points

yy=yDelta\*(rand(numbPoints,1))+yMin;%y coordinates of Poisson points

xxyy=[xx(:) yy(:)];

plot (xxyy(:, 1), xxyy(:, 2),'.','MarkerSize',10);

view(3)

hold on

N = 1;

x1=5;

y1=3;

z1=20;

%Get random x,y coordinates for those points.

x1y1z1= rand(N, 1);

%subplot(2, 2, 1);

plot(x1y1z1, '.', 'MarkerSize', 20);

%grid on;

hold off

d=sqrt(((xx-x1).^2)+((yy-y1).^2)); % horizontal distance between UAV an the Point

l=sqrt((d.^2)+(z1.^2)); %The distance of the diagonal

alpha\_L=2;% path loss exponent

alpha\_N=2.5;

k=-31;

G\_L=k.\*(1./l.^alpha\_L);%path loss for line of sight

G\_N=k.\*(1./l.^alpha\_N);%path loss for line of sight

h\_L=G\_L.\*(1./l.^alpha\_L);

h\_N=G\_N.\*(1./l.^alpha\_N);

% for sub urbun environment

a=4.8;

b=0.43;

theta=atan(z1./d);

%thetaindeg=radtodeg(theta);

P=1./(1+a\*exp((-b).\*(theta-a))); %line of sight probability = p

%non-line of sight probability = 1- p

h=((P.\*h\_L)+((1-P).\*h\_N)); %channel coefficient

%variance = 1

EbN0dB=0:2:20;

i=1:length(EbN0dB);

n=1/sqrt(2)\*(randn(1,N)+1i\*randn(1,N)) ; %AWGN noise with mean=0 var=1

P\_t=30;

P\_r= (h.\*P\_t)+n;

SINR=1;

I=(P\_r/SINR)-n;

%plot(P\_t,P\_r);

%%grid on;

%xlabel('P\_t');

%ylabel('P\_r');