Comparación resultados Teóricos y Simulados Escenario 11

Resultados de simulación sin Obstaćulos densidad baja

```
%Promedio PDR
%Filas Densidad de menos a mas, columnas Beconing 1,2,5 y 10 Hz

PDR_MEAN(1,:) = [[0.987460024253519], [0.9835566890077614], [0.9530601608151577], [0.835220377

%Promedio CBR:
CBR_MEAN(1,:) = [[0.06434224419620226], [0.1283958646450102], [0.31419824490679], [0.57470678

%STD PDR:
PDR_STD(1,:) = [[0.002894612324748823], [0.004128622274483598], [0.006851882018366749], [0.017

%STD CBR:
CBR_STD(1,:) = [[0.0003352362990634571], [0.0006996883072163453], [0.001956066467237026], [0.0
```

Resultados de modelo teórico

```
PDR_T = base_PDR_results(1,:); %[0.9819 0.9775 0.9641 0.9419];
CBR_T = base_CBR_results(1,:);
NAR_T = [1-(1-PDR_T(1)).^1 1-(1-PDR_T(2)).^2 1-(1-PDR_T(3)).^3 1-(1-PDR_T(4)).^3];
```

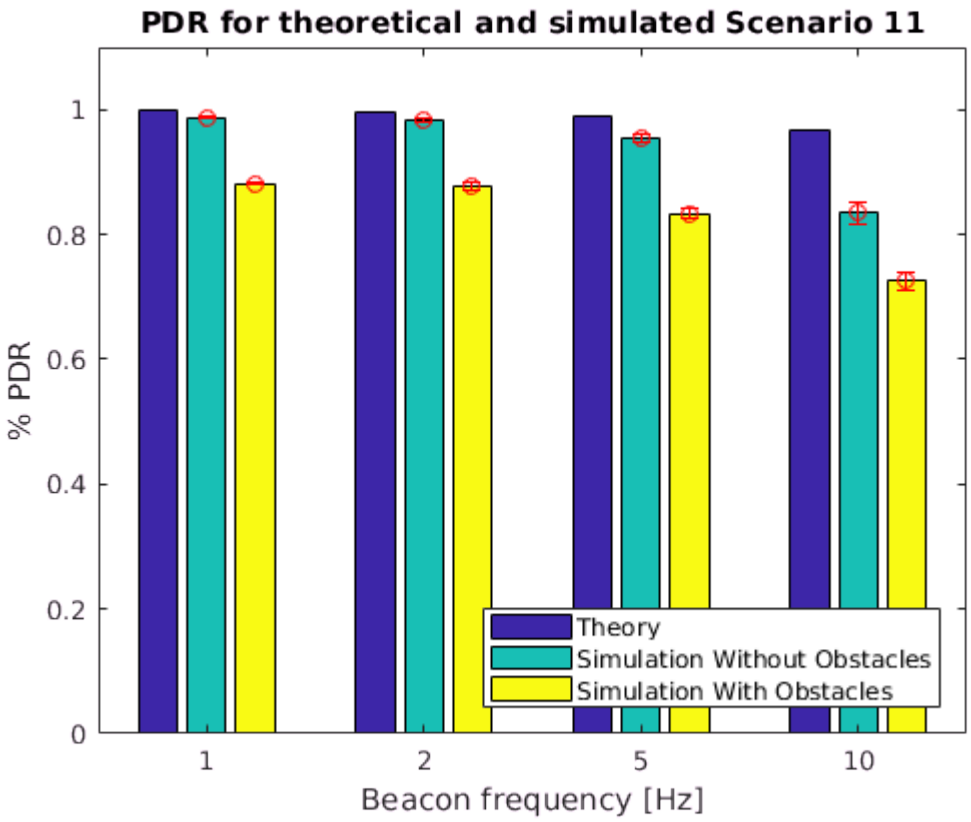
Resultados de simulación con obstáculos

```
% PDR Con obstáculos
PDR2_MEAN(1,:) =[[0.8817944950923657], [0.8767091047975317], [0.8329120310058258], [0.7253901

% STD PDR:
PDR2_STD(1,:) = [[0.0024761504623913846], [0.006482423865172622], [0.007711375824828157], [0.0

CBR2_MEAN(1,:) = [[0.056821857824798025], [0.1132679155877659], [0.27423807642986553], [0.5038

%STD CBR:
CBR2_STD(1,:) =[[0.007750999282908913], [0.015405846766808083], [0.035276861433956114], [0.060
```

Obtención de VAP

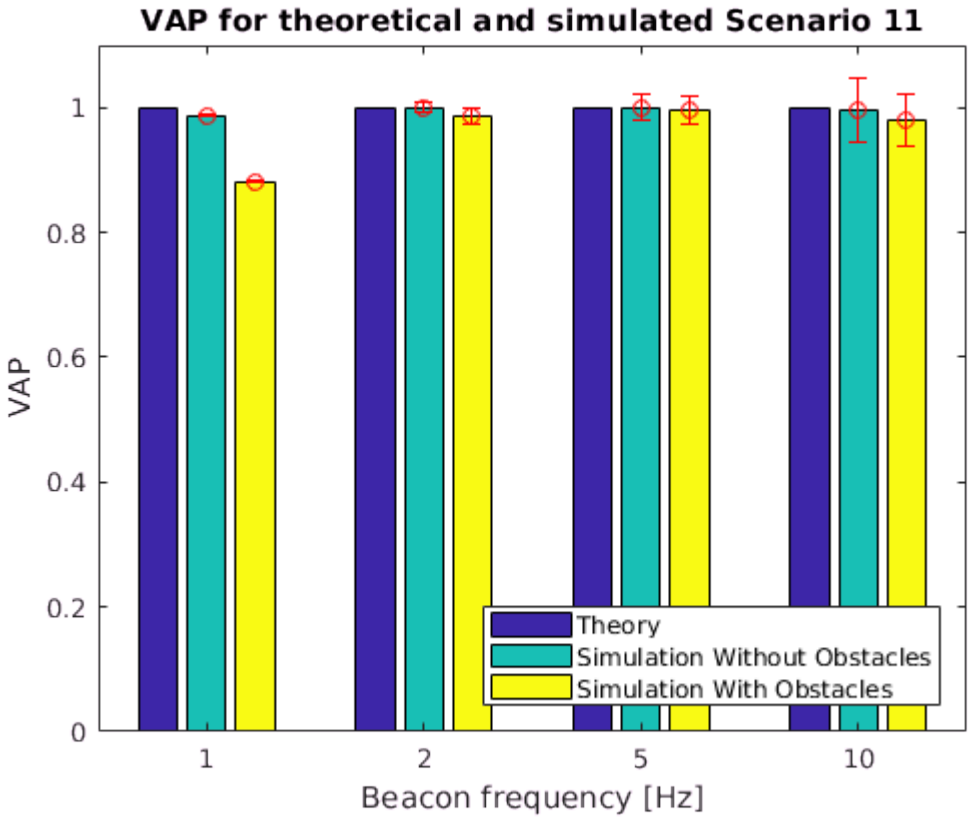
```
Sc1 = [ PDR_T(1,:) ; PDR_MEAN(1,:) ; PDR2_MEAN(1,:)];
z=5.4579;

Sc1_std = [PDR_STD(1,:) ; PDR2_STD(1,:)];

Sc1_nar = [1-(1-Sc1(:,1)).^1 1-(1-Sc1(:,2)).^2 1-(1-Sc1(:,3)).^3 1-(1-Sc1(:,4)).^3];

Sc1_nar_std = [1-(1-Sc1_std(:,1)).^1 1-(1-Sc1_std(:,2)).^2 1-(1-Sc1_std(:,3)).^3 1-(1-Sc1_std(

Sc1_c = [ CBR_T(1,:) ; CBR_MEAN(1,:) ; CBR2_MEAN(1,:)];
```

```
figure (1)

bar(Sc1','DisplayName','PDR_MEAN');
hold on

title('PDR for theoretical and simulated Scenario 11');
xlabel('Beacon frequency [Hz]');
ylabel('% PDR');

x=[1 2 3 4];
%x2=[];
%x2(:,1)=x-0.27;
%x2(:,2)=x-0.1;
%x2(:,3)=x+0.1;
%x2(:,4)=x+0.27;
x2 = x + 0.22;
errorbar(x,PDR_MEAN(1,:),PDR_STD(1,:),'ro');
hold on
errorbar(x2,PDR2_MEAN(1,:),PDR2_STD(1,:),'ro');
legend('Theory','Simulation Without Obstacles','Simulation With Obstacles','Location','SouthEa
ylim([0, 1.1])
xticklabels([1 2 5 10])
hold off
```



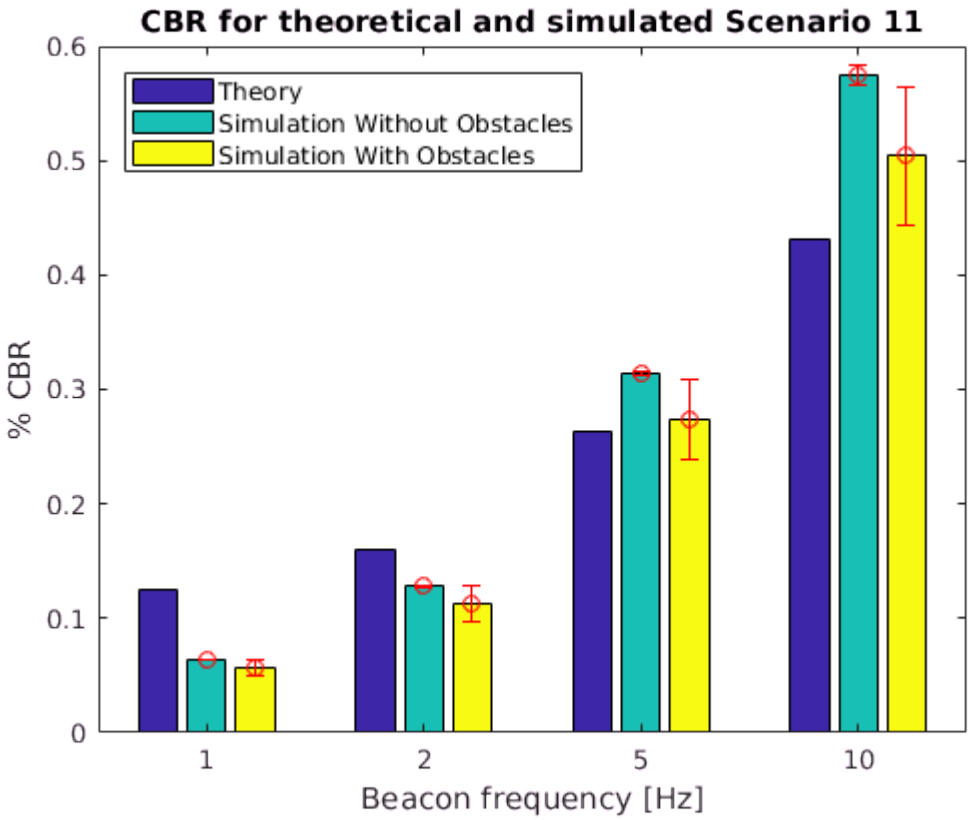

```
figure (2)

bar(Sc1_nar','DisplayName','PDR_MEAN');
```

```
hold on

title('VAP for theoretical and simulated Scenario 11');
xlabel('Beacon frequency [Hz]');
ylabel('VAP');

x=[1 2 3 4];
x2 = x + 0.22;
errorbar(x,Sc1_nar(2,:),Sc1_nar_std(1,:),'ro');
hold on
errorbar(x2,Sc1_nar(3,:),Sc1_nar_std(2,:),'ro');
legend('Theory','Simulation Without Obstacles','Simulation With Obstacles','Location','SouthEa
ylim([0, 1.1])
xticklabels([1 2 5 10])
hold off
```




```
figure (3)
%bar(PDR_MEAN,'DisplayName','PDR_MEAN')
bar(Sc1_c','DisplayName','CBR_MEAN');
hold on

title('CBR for theoretical and simulated Scenario 11');
xlabel('Beacon frequency [Hz]');
ylabel('% CBR');

errorbar(x,CBR_MEAN(1,:),CBR_STD(1,:),'ro');

hold on
```

```
errorbar(x2,CBR2_MEAN(1,:),CBR2_STD(1,:),'ro');
legend('Theory','Simulation Without Obstacles','Simulation With Obstacles','Location','NorthWe

%ylim([0, 1.1])
xticklabels([1 2 5 10])
hold off
```




```
```

Resultados de simulación sin Obstaćulos **densidad Alta**

```
%Promedio PDR
%Filas Densidad de menos a mas, columnas Beconing 1,2,5 y 10 Hz

PDR_MEAN(1,:) = [[0.9887457349441109], [0.9708568489218841], [0.861268230630499], [0.518993400

%Promedio CBR:
CBR_MEAN(1,:) = [[0.11896501266589578], [0.23505330249509881], [0.5414981152228623], [0.778949

%STD PDR:
PDR_STD(1,:) = [[0.006162240741160844], [0.006954928395607039], [0.011366406517210301], [0.005

%STD CBR:
CBR_STD(1,:) = [[0.0008624650769769522], [0.0017817884933543117], [0.005636032605108568], [0.0
```

Resultados de modelo teórico

```
PDR_T = base_PDR_results(2,:); %[0.9819 0.9775 0.9641 0.9419];
CBR_T = base_CBR_results(2,:);
NAR_T = [1-(1-PDR_T(1)).^1 1-(1-PDR_T(2)).^2 1-(1-PDR_T(3)).^3 1-(1-PDR_T(4)).^3];
```

Resultados de simulación con obstáculos

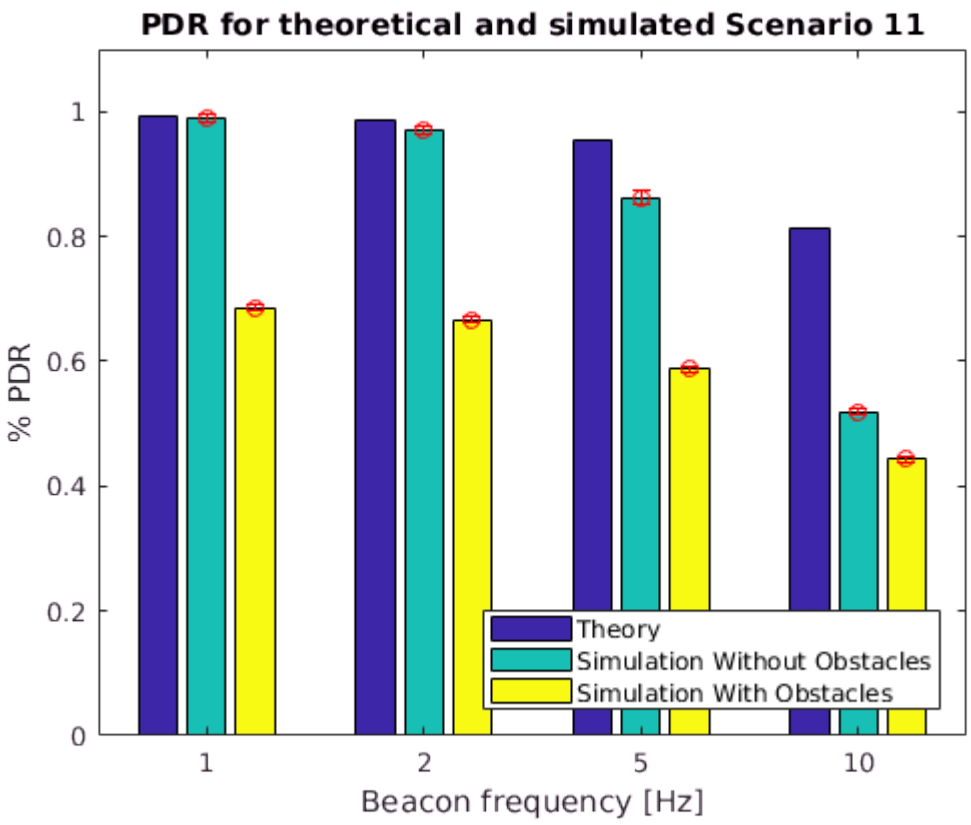
```
% PDR Con obstáculos
PDR2_MEAN(1,:) =[[0.685425602590316], [0.6661125587755339], [0.5879666089082995], [0.443470843

% STD PDR:
PDR2_STD(1,:) = [[0.005023359310975755], [0.004970768549817921], [0.0045792915541762865], [0.0

CBR2_MEAN(1,:) =[[0.08273222620948552], [0.16257209216719398], [0.37852607640419134], [0.63945

%STD CBR:
CBR2_STD(1,:) =[[0.01675695448388022], [0.031186318702315464], [0.0613567883103313], [0.076057
```

Obtención de NAR

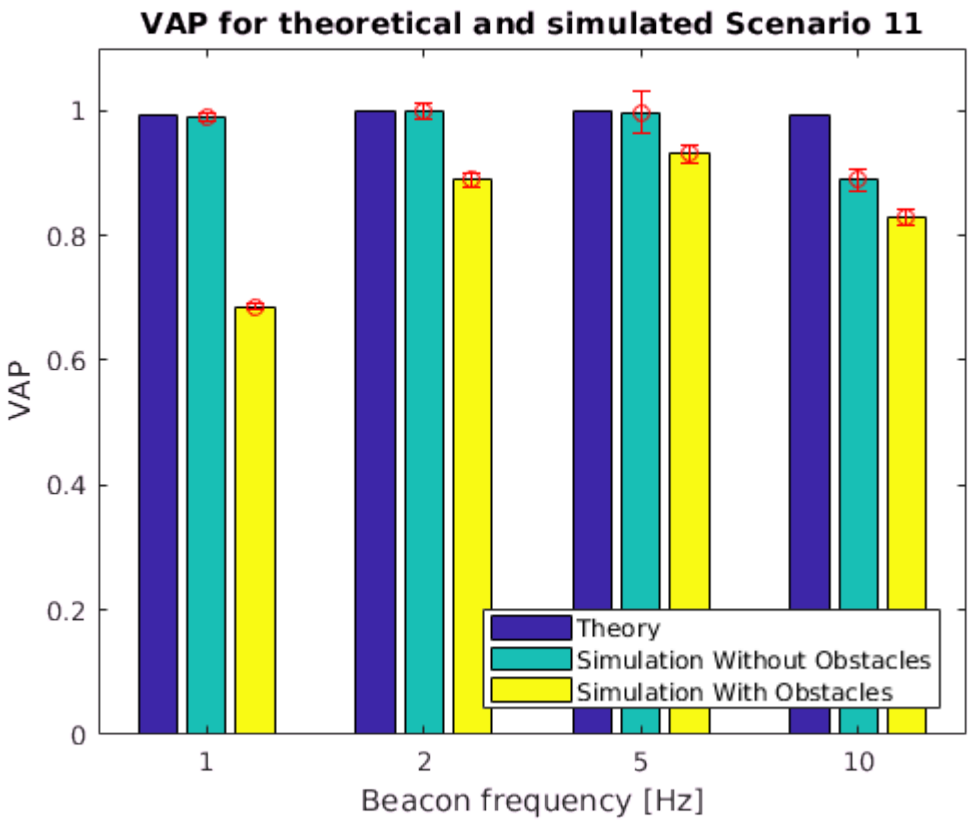
```
Sc1 = [ PDR_T(1,:) ; PDR_MEAN(1,:) ; PDR2_MEAN(1,:)];

z=5.4579;

Sc1_std = [PDR_STD(1,:) ; PDR2_STD(1,:)];

Sc1_nar = [1-(1-Sc1(:,1)).^1 1-(1-Sc1(:,2)).^2 1-(1-Sc1(:,3)).^3 1-(1-Sc1(:,4)).^3];

Sc1_nar_std = [1-(1-Sc1_std(:,1)).^1 1-(1-Sc1_std(:,2)).^2 1-(1-Sc1_std(:,3)).^3 1-(1-Sc1_std(

Sc1_c = [ CBR_T(1,:) ; CBR_MEAN(1,:) ; CBR2_MEAN(1,:)];
```

```
figure (1)

bar(Sc1','DisplayName','PDR_MEAN');
hold on

title('PDR for theoretical and simulated Scenario 11');
xlabel('Beacon frequency [Hz]');
ylabel('% PDR');

x=[1 2 3 4];
%x2=[];
%x2(:,1)=x-0.27;
%x2(:,2)=x-0.1;
%x2(:,3)=x+0.1;
%x2(:,4)=x+0.27;
x2 = x + 0.22;
errorbar(x,PDR_MEAN(1,:),PDR_STD(1,:),'ro');
hold on
errorbar(x2,PDR2_MEAN(1,:),PDR2_STD(1,:),'ro');
legend('Theory','Simulation Without Obstacles','Simulation With Obstacles','Location','SouthEa
ylim([0, 1.1])
xticklabels([1 2 5 10])
```

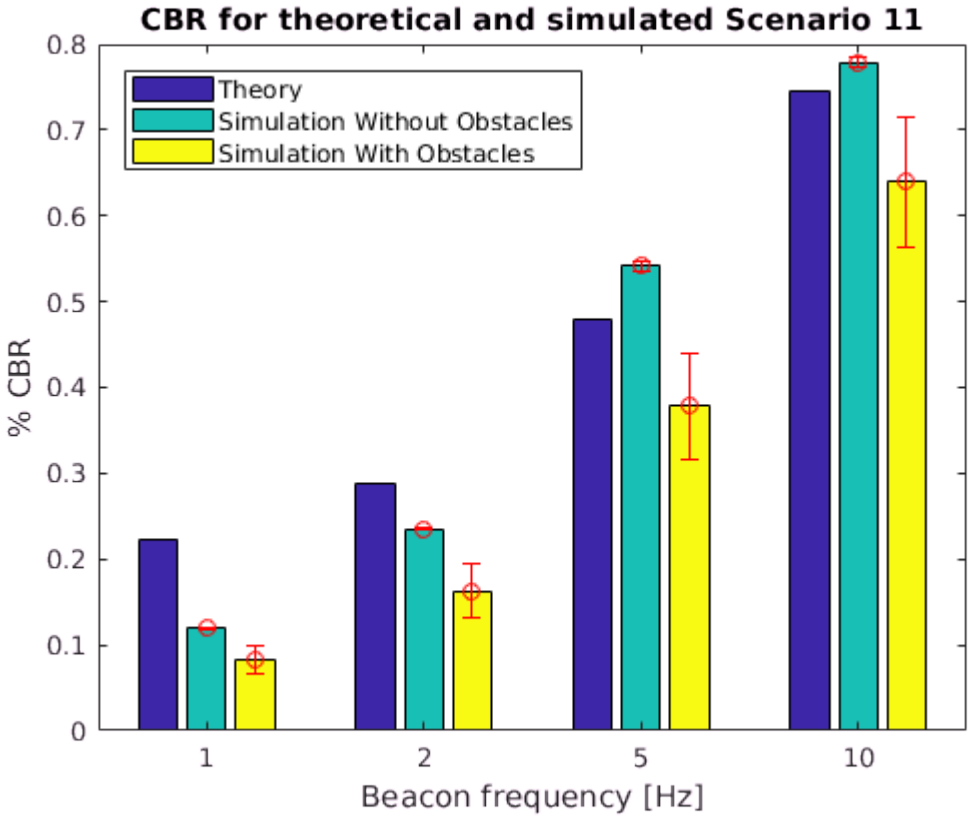
```
hold off
```




```
figure (2)

bar(Sc1_nar','DisplayName','PDR_MEAN');
hold on

title('VAP for theoretical and simulated Scenario 11');
xlabel('Beacon frequency [Hz]');
ylabel('VAP');

x=[1 2 3 4];
x2 = x + 0.22;
errorbar(x,Sc1_nar(2,:),Sc1_nar_std(1,:),'ro');
hold on
errorbar(x2,Sc1_nar(3,:),Sc1_nar_std(2,:),'ro');
legend('Theory','Simulation Without Obstacles','Simulation With Obstacles','Location','SouthEa
ylim([0, 1.1])
xticklabels([1 2 5 10])
hold off
```




```
figure (3)
%bar(PDR_MEAN,'DisplayName','PDR_MEAN')
bar(Sc1_c','DisplayName','CBR_MEAN');
hold on

title('CBR for theoretical and simulated Scenario 11');
xlabel('Beacon frequency [Hz]');
ylabel('% CBR');

errorbar(x,CBR_MEAN(1,:),CBR_STD(1,:),'ro');

hold on
errorbar(x2,CBR2_MEAN(1,:),CBR2_STD(1,:),'ro');
legend('Theory','Simulation Without Obstacles','Simulation With Obstacles','Location','NorthWe

%ylim([0, 1.1])
xticklabels([1 2 5 10])
hold off
```

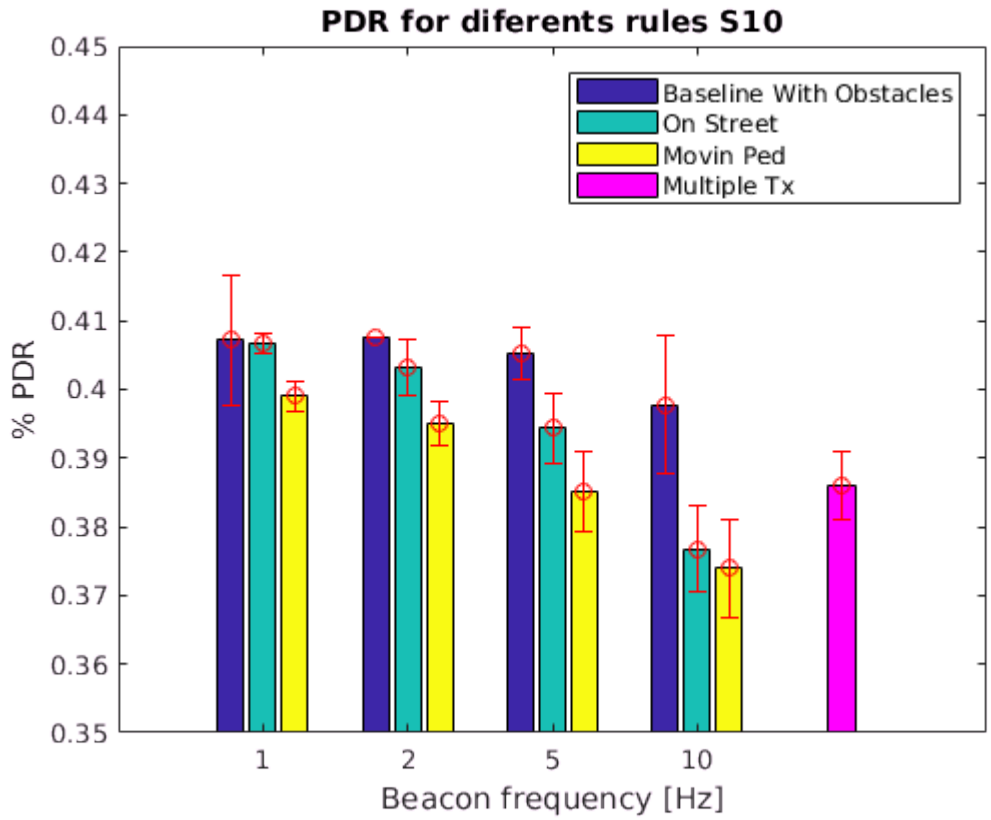


Resultados de simulación para diferentes reglas

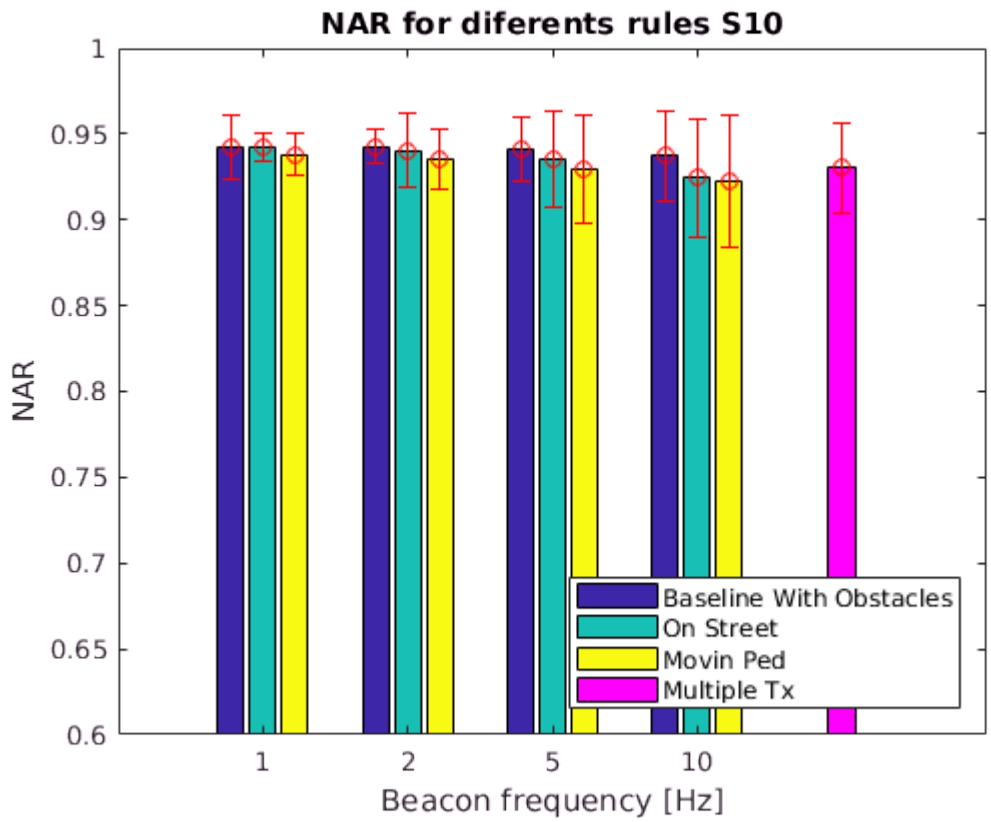
```
% OS- OnStreet
%Promedio PDR:
PDR_OS = [[0.40681471053708823], [0.4032331986336438], [0.39440935152495926], [0.3767873143334
%Promedio CBR:
CBR_OS =[[0.005986331509146898], [0.011947814613096385], [0.029427580063394042], [0.0575357912

%STD PDR:
STD_PDR_OS = [[0.0014750657471692382], [0.0040055276615099935], [0.005110585887975328], [0.006

%STD CBR:
STD_CBR_OS = [[0.0021758722245777], [0.004308496237058689], [0.0105215924625247], [0.020280005

NAR_OS = 1-(1-PDR_OS).^5.4579;

STD_NAR_OS = 1-(1-STD_PDR_OS).^5.4579;


% MP - MovinPed

%Promedio PDR:
PDR_MP = [[0.3990678583633519], [0.3949718529523576], [0.385095968129186], [0.3739662738575666
%Promedio CBR:
CBR_MP = [[0.005722103290144922], [0.011282359686364889], [0.027348491610065917], [0.053887279
%STD PDR:
STD_PDR_MP = [[0.0022208738278831604], [0.003209642579977184], [0.0058627334449584], [0.007133
%STD CBR:
STD_CBR_MP = [[0.002048426853533392], [0.003998177916736177], [0.009515707066208853], [0.01856
```

```
NAR_MP = 1-(1-PDR_MP).^5.4579;
STD_NAR_MP = 1-(1-STD_PDR_MP).^5.4579;

% Multiple TX

%Promedio PDR:
PDR_MTX = [0.3860273417346675];
%Promedio CBR:
CBR_MTX = [0.020034934155854167];
%STD PDR:
STD_PDR_MTX = [0.004838705306553557];
%STD CBR:
STD_CBR_MTX = [0.007753098388170993];

NAR_MTX = 1-(1-PDR_MTX).^5.4579;
STD_NAR_MTX = 1-(1-STD_PDR_MTX).^5.4579;


Scr_PDR = [PDR2_MEAN(1,:) ; PDR_OS ; PDR_MP];
```

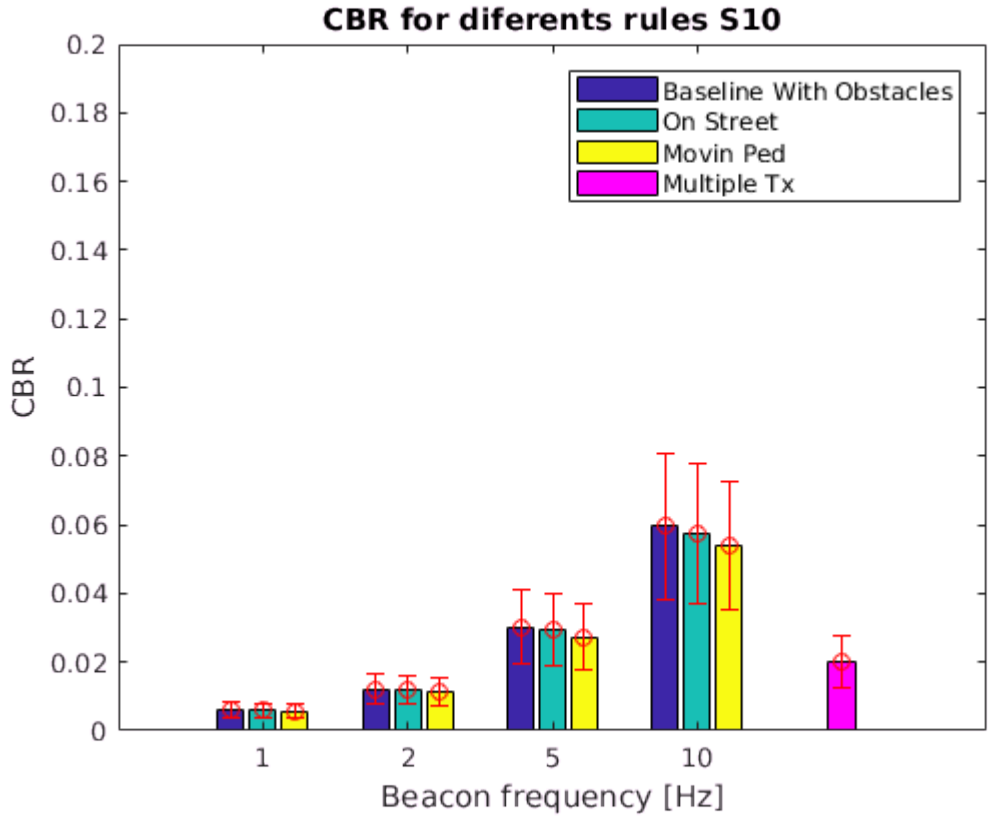
```
figure (4)

bar(Scr_PDR','DisplayName','PDR_MEAN');
hold on

title('PDR for diferents rules S10');
xlabel('Beacon frequency [Hz]');
ylabel('% PDR');

x=[1 2 3 4];
x1 = x - 0.22;
x3 = x + 0.22;
errorbar(x1,PDR2_MEAN(1,:),PDR2_STD(1,:),'ro');
hold on
errorbar(x,PDR_OS,STD_PDR_OS,'ro');
hold on
errorbar(x3,PDR_MP,STD_PDR_MP,'ro');
legend('Baseline With Obstacles','On Street','Movin Ped','Location','NorthEast');
ylim([0.35,0.45])
xticklabels([1 2 5 10])
hold on
bar([0 0 0 0 PDR_MTX],0.2,'m','DisplayName','Multiple Tx');
%legend('Baseline With Obstacles','On Street','Movin Ped','Multiple Tx','Location','NorthEast'
hold on
errorbar([-1 -1 -1 -1 PDR_MTX],[0 0 0 0 STD_PDR_MTX],'ro','HandleVisibility','off');
hold off
```




```
figure (5)

Scr_NAR = [Sc1_nar(3,:) ; NAR_OS ; NAR_MP];
bar(Scr_NAR','DisplayName','NAR_MEAN');
hold on

title('NAR for diferents rules S10');
xlabel('Beacon frequency [Hz]');
ylabel('NAR');

x=[1 2 3 4];
x1 = x - 0.22;
x3 = x + 0.22;
errorbar(x1,(1-(1-PDR2_MEAN(1,:)).^z),(1-(1-PDR2_STD(1,:)).^z),'ro');
hold on
errorbar(x,NAR_OS,STD_NAR_OS,'ro');
hold on
errorbar(x3,NAR_MP,STD_NAR_MP,'ro');
legend('Baseline With Obstacles','On Street','Movin Ped','Location','SouthEast');
ylim([0.6 1]) %.35,0.45])
xticklabels([1 2 5 10])
hold on
%x4 = [1 2 3 4 5]
bar([0 0 0 0 NAR_MTX],0.2,'m','DisplayName','Multiple Tx');
%legend('Baseline With Obstacles','On Street','Movin Ped','Multiple Tx','Location','NorthEast'
hold on
errorbar([-1 -1 -1 -1 NAR_MTX],[0 0 0 0 STD_NAR_MTX],'ro','HandleVisibility','off');
hold off
```




```
figure (6)
Scr_CBR = [CBR2_MEAN(1,:) ; CBR_OS ; CBR_MP];

bar(Scr_CBR','DisplayName','CBR_MEAN');
hold on

title('CBR for diferents rules S10');
xlabel('Beacon frequency [Hz]');
ylabel('CBR');

x=[1 2 3 4];
x1 = x - 0.22;
x3 = x + 0.22;
errorbar(x1,CBR2_MEAN(1,:),CBR2_STD(1,:),'ro');
hold on
errorbar(x,CBR_OS,STD_CBR_OS,'ro');
hold on
errorbar(x3,CBR_MP,STD_CBR_MP,'ro');
legend('Baseline With Obstacles','On Street','Movin Ped','Location','NorthEast');
ylim([0 0.2]) %.35,0.45])
xticklabels([1 2 5 10])
hold on
bar([0 0 0 0 CBR_MTX],0.2,'m','DisplayName','Multiple Tx');
%legend('Baseline With Obstacles','On Street','Movin Ped','Multiple Tx','Location','NorthEast'
hold on
errorbar([-1 -1 -1 -1 CBR_MTX],[0 0 0 0 STD_CBR_MTX],'ro','HandleVisibility','off');
hold off
```


CBR for diferents rules S10
Baseline With Obstacles
On Street
Movin Ped
Multiple Tx
CBR
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1
2
5
10
Beacon frequency [Hz]