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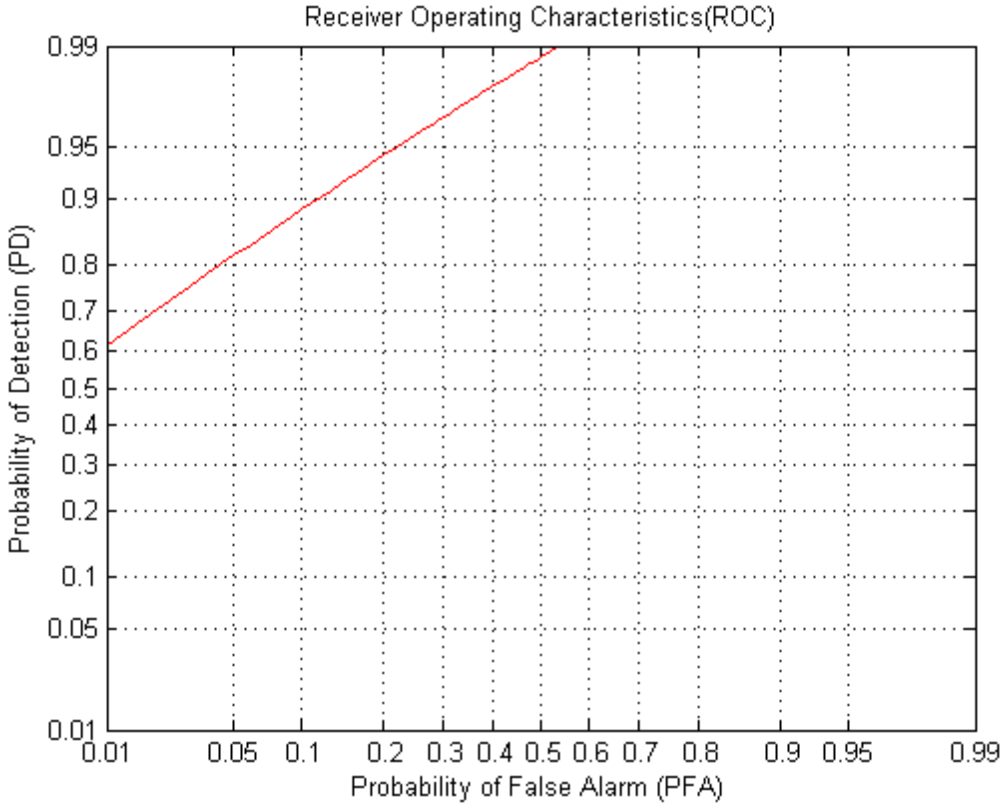
SKEP with fixed ENR

```
clear;clc;
ENR = 10;
lambda = ENR;
pf1 = 0.01:0.01:1;
x1 = -2*log(pf1);
pd1 = Qchipr2(2, lambda, x1, 1e-5);
figure(1)
probpaper(pf1,pd1, 'r');
```

```
##: axes YTickLabels has been renamed YTickLabel for consistency with all

mode/value property pairs, whose root names are singular, not plural.
##: axes XTickLabels has been renamed XTickLabel for consistency with all
mode/value property pairs, whose root names are singular, not plural.
```

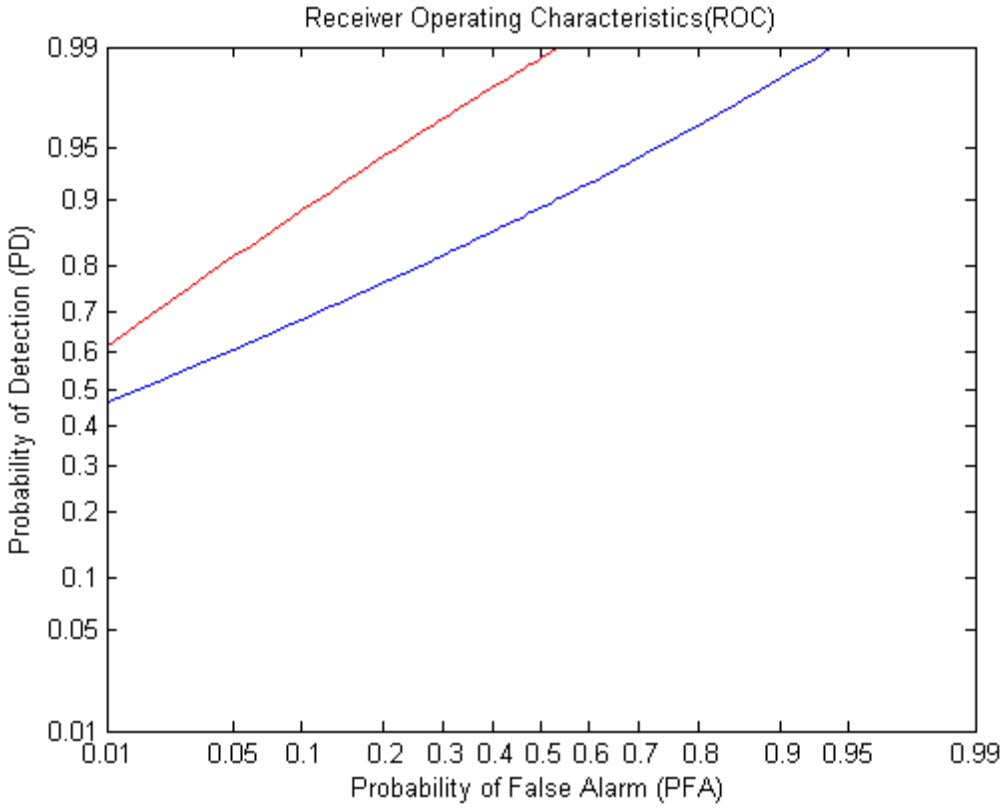


Rayleigh fading sinusoid with fixed ENR

```
pf2=0.01:0.01:1;
pd2=pf2.^(1/(1+ENR/2));
figure(1)
hold on
probpaper(pf2,pd2, 'b')
```

```
        ##: axes YTickLabels has been renamed YTickLabel for consistency with all

        mode/value property pairs, whose root names are singular, not plural.
        ##: axes XTickLabels has been renamed XTickLabel for consistency with all
        mode/value property pairs, whose root names are singular, not plural.
```



Energy detector with fixed ENR

N = 128

```
N1=128;
pf3=0.01:0.01:1;
pd3=zeros(1,100);
for i=1:100
    r1=getgama(pf3(i),N1);
    R1=2*r1;
    gama1=R1/(ENR/N1+1);
    pd3(i)=Qchipr2(N1,0,gama1,1e-5);
```

```
end
figure(1)
hold on
probpaper(pf3,pd3, 'y')
% N = 16
N2=16;
pf4=0.01:0.01:1;
grid
r2=getgama(pf4,N2);
R2=2*r2;
gama2=R2/(ENR/N2+1);
pd4=Qchipr2(N2,0,gama2,1e-5);
figure(1)
probpaper(pf4,pd4, 'c')
legend('SKEP', 'Rayleigh fading sinusoid', 'Energy detector with N = 128', 'Energy
```

```
##: axes YTickLabels has been renamed YTickLabel for consistency with all

mode/value property pairs, whose root names are singular, not plural.
##: axes XTickLabels has been renamed XTickLabel for consistency with all
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##: axes YTickLabels has been renamed YTickLabel for consistency with all
mode/value property pairs, whose root names are singular, not plural.
##: axes XTickLabels has been renamed XTickLabel for consistency with all
mode/value property pairs, whose root names are singular, not plural.
```
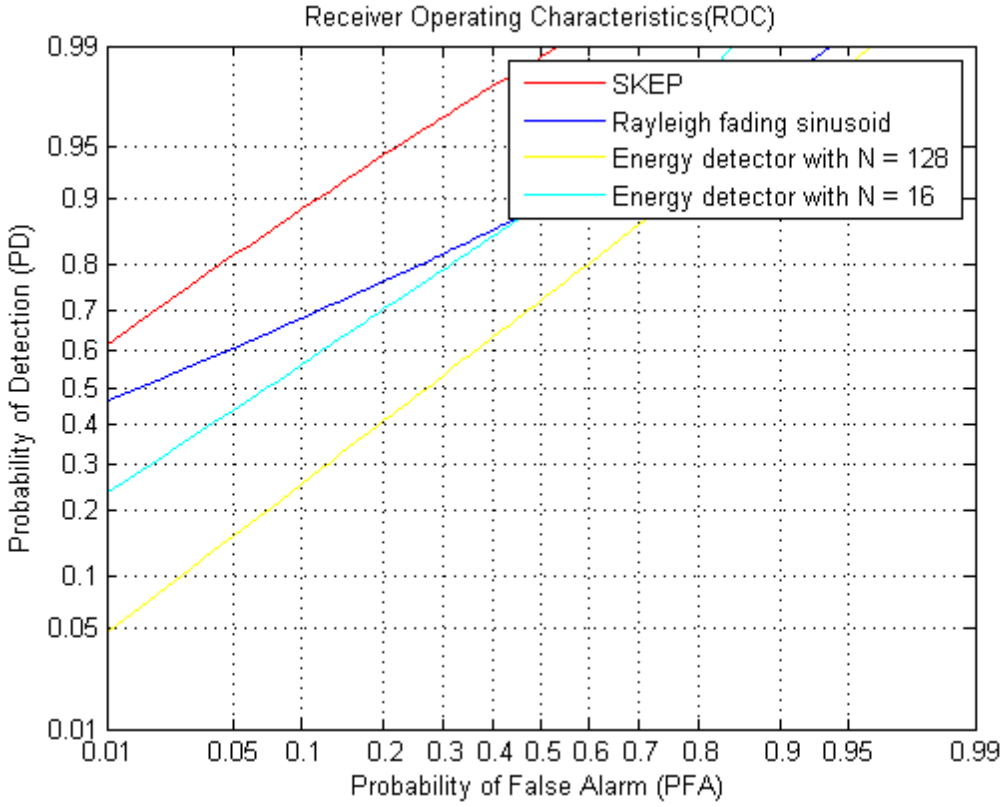
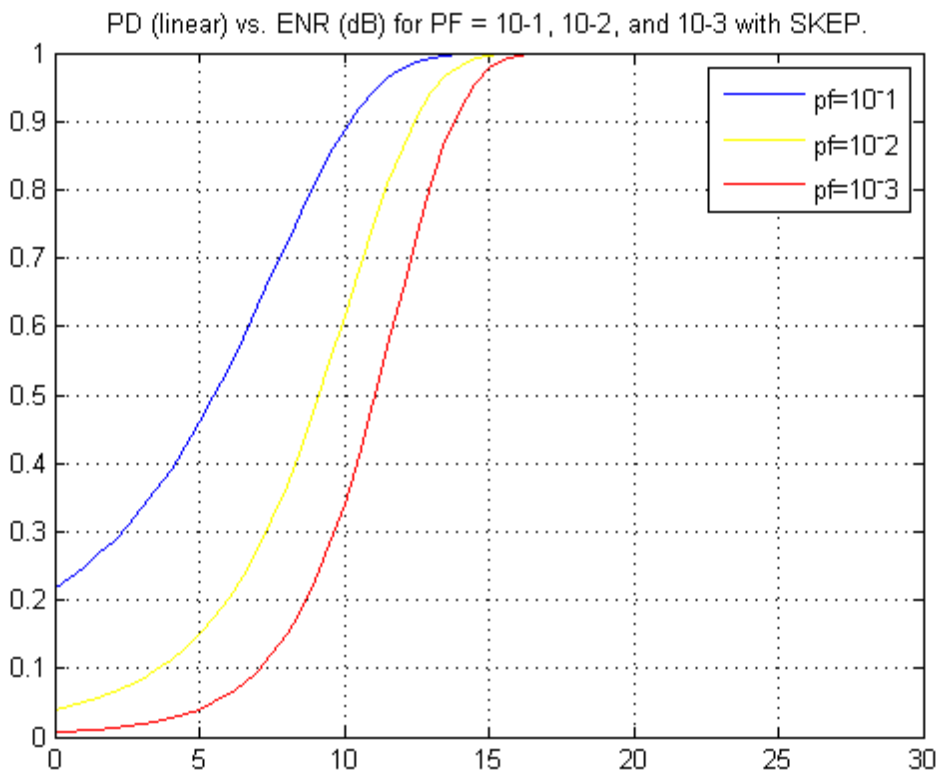



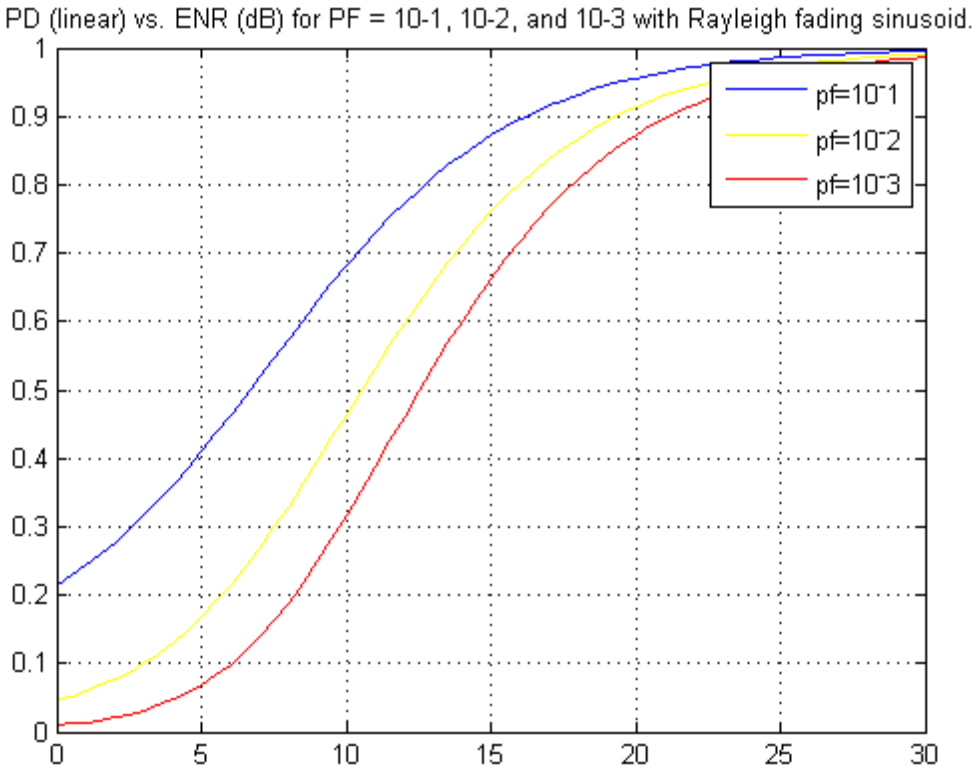
3B SKEP

```
pf1 = 10^-1;
pf2 = 10^-2;
pf3 = 10^-3;
ENR=0:0.5:30;
lambda=10.^(ENR/10);
x1=2*log(1/pf1);
x2=2*log(1/pf2);
x3=2*log(1/pf3);
pd1=zeros(1,61);
pd2=zeros(1,61);
pd3=zeros(1,61);
for i=1:61
    pd1(i)=Qchipr2(2,lambda(i),x1,1e-5);
    pd2(i)=Qchipr2(2,lambda(i),x2,1e-5);
    pd3(i)=Qchipr2(2,lambda(i),x3,1e-5);
end
figure(2)
plot(ENR,pd1,'b')
hold on
plot(ENR,pd2,'y')
plot(ENR,pd3,'r')
grid;
title('PD (linear) vs. ENR (dB) for PF = 10-1, 10-2, and 10-3 with SKEP.');
legend('pf=10^-1','pf=10^-2','pf=10^-3');
```



Rayleigh

```
x=10.^(ENR/10);
y=1./(x/2+1);
pd4=pf1.^y;
pd5=pf2.^y;
pd6=pf3.^y;
figure(3)
plot(ENR,pd4,'b')
hold on
plot(ENR,pd5,'y')
plot(ENR,pd6,'r')
grid;
title('PD (linear) vs. ENR (dB) for PF = 10-1, 10-2, and 10-3 with Rayleigh fading
legend('pf=10^-1','pf=10^-2','pf=10^-3');
```

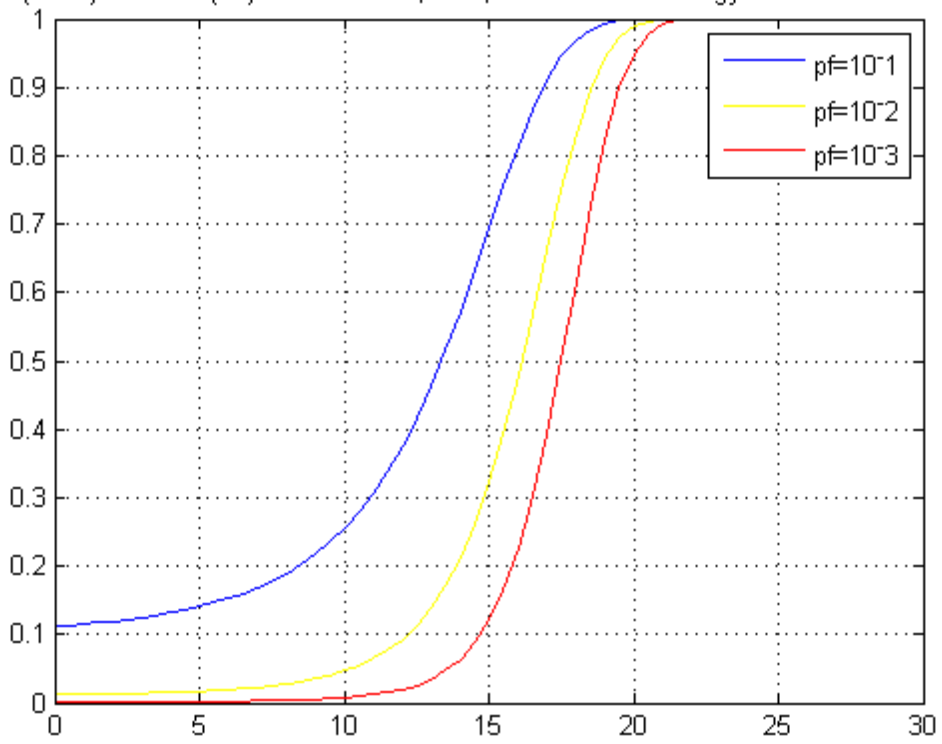


Energy Detector

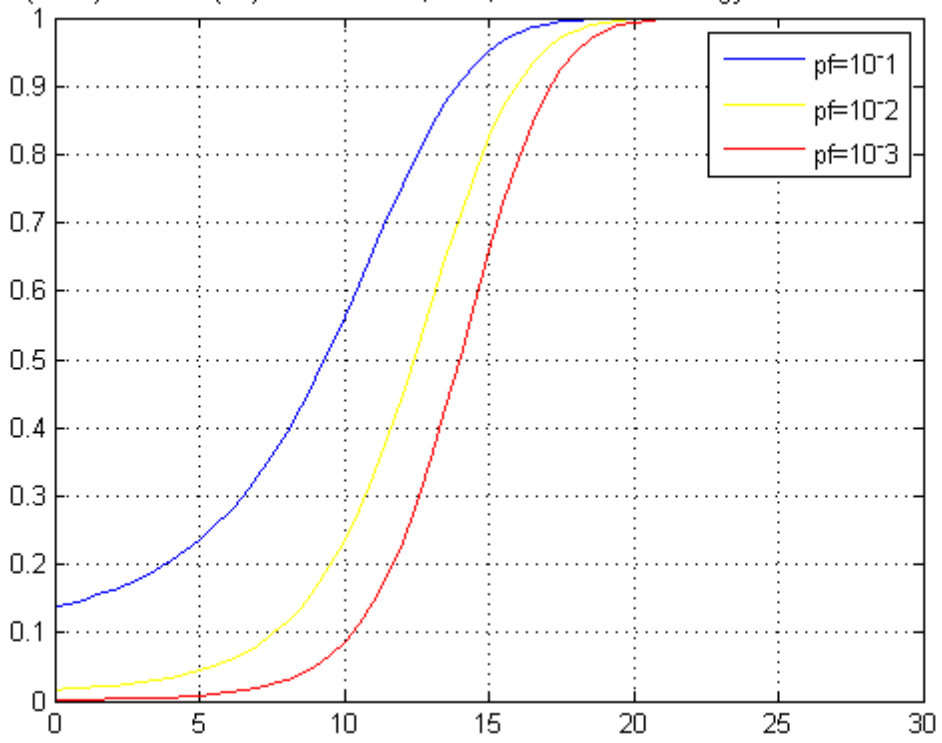
```
%N=128
N1=128;
pd7=zeros(1,61);
pd8=zeros(1,61);
pd9=zeros(1,61);
r7=getgama(pf1,N1);
R7=2*r7;
r8=getgama(pf2,N1);
R8=2*r8;
r9=getgama(pf3,N1);
R9=2*r9;
for i=1:61
    gama7=R7/(x(i)/N1+1);
    pd7(i)=Qchipr2(N1,0,gama7,1e-5);
    gama8=R8/(x(i)/N1+1);
    pd8(i)=Qchipr2(N1,0,gama8,1e-5);
    gama9=R9/(x(i)/N1+1);
    pd9(i)=Qchipr2(N1,0,gama9,1e-5);
end
figure(4)
plot(ENR,pd7,'b')
hold on
plot(ENR,pd8,'y')
```

```
plot(ENR,pd9,'r')
axis([0 30 0 1])
grid;
title('PD (linear) vs. ENR (dB) for PF = 10-1, 10-2, and 10-3 with Energy Detecor
legend('pf=10^-1','pf=10^-2','pf=10^-3');

% N= 16
N2=16;
pd10=zeros(1,61);
pd11=zeros(1,61);
pd12=zeros(1,61);
r10=getgama(pf1,N2);
R10=2*r10;
r11=getgama(pf2,N2);
R11=2*r11;
r12=getgama(pf3,N2);
R12=2*r12;
for i=1:61
    gama10=R10/(x(i)/N2+1);
    pd10(i)=Qchipr2(N2,0,gama10,1e-5);
    gama11=R11/(x(i)/N2+1);
    pd11(i)=Qchipr2(N2,0,gama11,1e-5);
    gama12=R12/(x(i)/N2+1);
    pd12(i)=Qchipr2(N2,0,gama12,1e-5);
end
figure(5)
plot(ENR,pd10,'b')
hold on
plot(ENR,pd11,'y')
plot(ENR,pd12,'r')
grid;
title('PD (linear) vs. ENR (dB) for PF = 10-1, 10-2, and 10-3 with Energy Detector
legend('pf=10^-1','pf=10^-2','pf=10^-3');
```

PD (linear) vs. ENR (dB) for PF = 10-1, 10-2, and 10-3 with Energy Detecor and N = 128.



PD (linear) vs. ENR (dB) for PF = 10-1, 10-2, and 10-3 with Energy Detector and N = 16.



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