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Appendix:

First experiment using method 1:

```
//n demonstrate path loss exponent
//p0 demonstrate reference distance


// ******************p(d)=po-10nlg(d/do)**************

clear all

p0=-45

n=2

d0=1

loc1= [5,35,35.5,12]                    //lo :location 1

loc2= [10,20,23.32,15.62]               //lo :location 2

loc3= [25,5,12,27.31]                   //lo :location 3

loc4= [40,10,14.866,41.48]              //lo :location 4

loc5= [5.5,30.5,30.5,5.5]               //lo :location 5

loc6= [11.41,20.47,20.74,11.41]    //lo :location 6

loc7= [25.59,7.43,7.43,25.59]       //lo :location 7

loc8= [30.5,5.5,5.5,30.5]               //lo :location 8

loc9= [12,35.5,35,5]                    //lo :location 9

loc10=[15.62,23.32,20,10]          //lo :location 10

loc11=[27.31,12,5,25]                  //lo :location 11

loc12=[41.48,14.866,10,40]          //lo :location 12
```

```
////////////////////////////////////// power at location 1to 12
    for i=1 :4
     pd(i,1)=p0-10*2*log10(loc1(i))
    end
    disp(pd(:,1))
    for i=1 :4
     pd(i,2)=p0-10*2*log10(loc2(i))
    end
    disp(pd(:,2))
    for i=1 :4
     pd(i,3)=p0-10*2*log10(loc3(i))
    end
    disp(pd(:,3))
    for i=1 :4
     pd(i,4)=p0-10*2*log10(loc4(i))
    end
    disp(pd(:,4))
    for i=1 :4
     pd(i,5)=p0-10*2*log10(loc5(i))
    end
    disp(pd(:,5))
```

```
for i=1 :4
 pd(i,6)=p0-10*2*log10(loc6(i))
end
disp(pd(:,6))
for i=1 :4
 pd(i,7)=p0-10*2*log10(loc7(i))
end
disp(pd(:,7))
for i=1 :4
 pd(i,8)=p0-10*2*log10(loc8(i))
end
disp(pd(:,8))
for i=1 :4
 pd(i,9)=p0-10*2*log10(loc9(i))
end
disp(pd(:,9))
for i=1 :4
 pd(i,10)=p0-10*2*log10(loc10(i))
end
disp(pd(:,10))
for i=1 :4
```

```
    pd(i,11)=p0-10*2*log10(loc11(i))
    end
   disp(pd(:,11))
    for i=1 :4
     pd(i,12)=p0-10*2*log10(loc12(i))
    end
    disp(pd(:,12))
disp(pd)
function [lo, up]=makerange(repo)       //  send receive power and get range
for i=1:4
  lo(i,1)=repo(i,1)-3
  up(i,1)=repo(i,1)+3
end
endfunction
function accep=acsept(pd)
   for i=1:12
      for j=1:4
           if (pd(j,i) < = up(j,1))
              if (pd(j ,i) > = lo(j,1))          //    accepted
                 accep(j,i)=1;
                else
```

```
                accep(j,i)=0;
              end
            end
        end
    end
    disp(accep)
  endfunction
repo=[-62 ;-61 ;-78 ;-68]
[lo,up]=makerange(repo)
disp(lo)
disp(up)
for i=1:4                //
     pd(i,13)=up(i,1)          //
     pd(i,14)=lo(i,1)     // and join the real values of power and the
  end                     //    range
disp(pd)
accep =acsept(pd)
    expect=sum(accep,"r")
   disp(expect)
    maxi=max(expect)
```

```
disp(maxi)

y=1
for i=1:12
   if expect(i)==maxi
      las(y)=i
      y=y+1
      end
end

 disp("the expected location is  " ); disp(las)



hist3d(expect);
```

Second experiment using method 2:

```
//n demonstrate path loss exponent

//p0 demonstrate reference distance

// ******************p(d)=po-10nlg(d/do)**************

clear all

p0=-45

n=2

d0=1

loc1= [5,35,35.5,12]                    //lo :location 1

loc2= [10,20,23.32,15.62]               //lo :location 2

loc3= [25,5,12,27.31]                   //lo :location 3

loc4= [40,10,14.866,41.48]              //lo :location 4

loc5= [5.5,30.5,30.5,5.5]               //lo :location 5

loc6= [11.41,20.47,20.74,11.41]         //lo :location 6

loc7= [25.59,7.43,7.43,25.59]           //lo :location 7

loc8= [30.5,5.5,5.5,30.5]               //lo :location 8

loc9= [12,35.5,35,5]                    //lo :location 9

loc10=[15.62,23.32,20,10]               //lo :location 10

loc11=[27.31,12,5,25]                   //lo :location 11

loc12=[41.48,14.866,10,40]              //lo :location 12
```

```
////////////////////////////////////////// power at location to 12
    for i=1 :4
     pd(i,1)=p0-10*2*log10(loc1(i))
    end
    disp(pd(:,1))
    for i=1 :4
     pd(i,2)=p0-10*2*log10(loc2(i))
    end
    disp(pd(:,2))
    for i=1 :4
     pd(i,3)=p0-10*2*log10(loc3(i))
    end
    disp(pd(:,3))
    for i=1 :4
     pd(i,4)=p0-10*2*log10(loc4(i))
    end
    disp(pd(:,4))
    for i=1 :4
     pd(i,5)=p0-10*2*log10(loc5(i))
    end
    disp(pd(:,5))
    for i=1 :4
     pd(i,6)=p0-10*2*log10(loc6(i))
```

```
end
disp(pd(:,6))
for i=1 :4
 pd(i,7)=p0-10*2*log10(loc7(i))
end
disp(pd(:,7))
for i=1 :4
 pd(i,8)=p0-10*2*log10(loc8(i))
end
disp(pd(:,8))
for i=1 :4
 pd(i,9)=p0-10*2*log10(loc9(i))
end
disp(pd(:,9))
for i=1 :4
 pd(i,10)=p0-10*2*log10(loc10(i))
end
disp(pd(:,10))
for i=1 :4
 pd(i,11)=p0-10*2*log10(loc11(i))
end
disp(pd(:,11))
for i=1 :4
```

```
      pd(i,12)=p0-10*2*log10(loc12(i))
     end
     disp(pd(:,12))
 disp(pd)
 function [po]=def(repo)
     for i=1:12
         for j=1:4
          po(j,i)= (repo(j)- pd(j,i))^2
         end
     end
 endfunction
repo=[-62 ;-61 ;-78 ;-68]
[po]=def(repo)
disp(po)
     expect=sum(po,"r")
    disp(expect)
     mini=min(expect)
disp(mini)
for i=1:12
if expect(i)==mini
   las= i
      end
end
```

```
   disp("the expected location is  ") ;
disp(las)
hist3d(expect);
```