

implementing rayleighchan in OFDM

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Hi everybody,

I am doing my M.SC thesis on the topic "ICI cancellation in OFDM". I have very limited time, if you can help me I will be grateful to you....

I can implement the OFDM structure in AWGN channel, it works very well..

But when i try to implement the system in a "rayleighchan", I obtain very bad BER results.

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N=256 ; % carriers  
GI=N/4; % Guard Interval=Cyclic prefix  
DataBit = randint(N,1,2); % obtain 0 and 1's  
DataMod = qammod(DataBit,2); % obtain modulated symbols (BPSK)  
  
Ifft=Ifft (DataMod, N); %Take ifft of the symbols  
x_t = [Ifft(N- GI + 1 : N);Ifft];  
  
%Here x_t enters the channel  
  
%CHANNEL  
  
pathgains=[1,0.63,0.1,0.01];  
gain= 10*log10(pathgains); % convert to dB  
  
pathdelays=[0,0.2,0.4,0.6]*1E-6;  
samplingtime=0.2E-6;  
fdoppler=50 ; % 50 Hz  
chan=rayleighchan(samplingtime,fdoppler,pathdelays,gain);  
  
chan.ResetBeforeFiltering=0;  
  
y_t=filter(chan,x_t);  
.....
```

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I have some questions:

1) Which parameters determine the sampling time of x_t and sampling time of the channel parameters? (It is a basic question sorry but I am confused...)

(I think sampling time= $0.2E-6$ and x_t 's sampling rate are not correlated in my code, may be it is the problem)

2) I do not determine any parameters like ; carrier frequency =2 MHz , OFDM symbol duration = 200us etc...
May I determine them, then how i can I put them in the code...(Again it is a basic question sorry but I am confused...)

2)If i use only "chan=rayleighchan(samplingtime, fdoppler)" then there is no problem, BER results are good...So am I choosing wrong pathdelays and samplingtime or am I doing wrong channel estimation&equalization?

3) How can I get channel impulse response? (Because chan.PathGains gives the path gains , not channel impulse response complex values)

4)I am taking chan.ResetBeforeFiltering=0 but not sure about it, am I doing this wrong?

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