**function [ber] = bersync(EbN0dB, sig, t)**

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**[ll,rr] = argn(0)**

**funcprot(0);**

**//Check number of arguments to be equal to 3**

**if rr~=3 then**

**error("Wrong number of input arguments.");**

**end;**

**//Check for validity of EbN0**

**if (isempty(EbN0dB) | ~isreal(EbN0dB))**

**error("EbN0 has to be a real vector");**

**end;**

**EbN0 = 10.^(EbN0dB/10); // converting from dB to linear scale**

**ber = 0;**

**//if the string is timing**

**if ~strcmpi(t,"timing")**

**if (~isscalar(sig) | sig<=0 | sig>0.5) then**

**error("Timing SIGMA must be between 0 and 0.5")**

**elseif(sig<%eps)**

**ber= qfunc(sqrt(2\*EbN0));**

**else**

**temp=intg(-10\*sig,10\*sig,list(time,sig,EbN0))\*sqrt(2)/(8\*sqrt(%pi)\*sig);**

**ber=temp+(erfc(sqrt(EbN0))/4);**

**end**

**end**

**//if the string is carrier**

**if ~strcmpi(t,"carrier")**

**if (~isscalar(sig) | sig<=0) then**

**error("Error in the carrier input")**

**elseif(sig<%eps)**

**ber= qfunc(sqrt(2\*EbN0));**

**else**

**ber=intg(0,10\*sig,list(carr,sig,EbN0))/(sqrt(2\*%pi)\*sig)**

**end**

**end**

**endfunction**

**//Timing function under integral**

**function T = time(phi,sig,EbN0), T = exp(-phi^2/(2\*sig^2))\*erfc(sqrt(EbN0)\*(1-2\*abs(phi))), endfunction**

**//Carrier function under integral**

**function C = carr(phi,sig,EbN0), C = exp(-phi^2/(2\*sig^2))\*erfc(sqrt(EbN0)\*cos(phi)), endfunction**

**function y = qfunc(x)**

**y = 0.5\*erfc(x/sqrt(2));**

**endfunction**