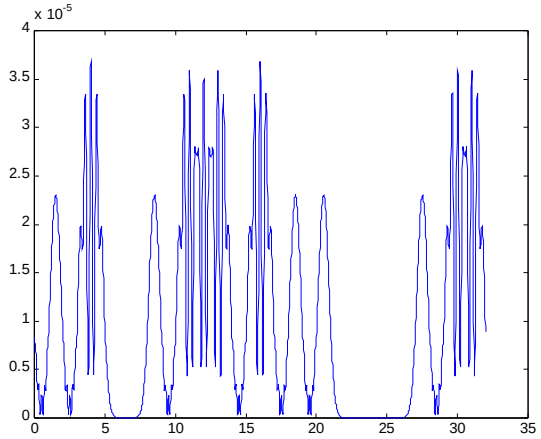
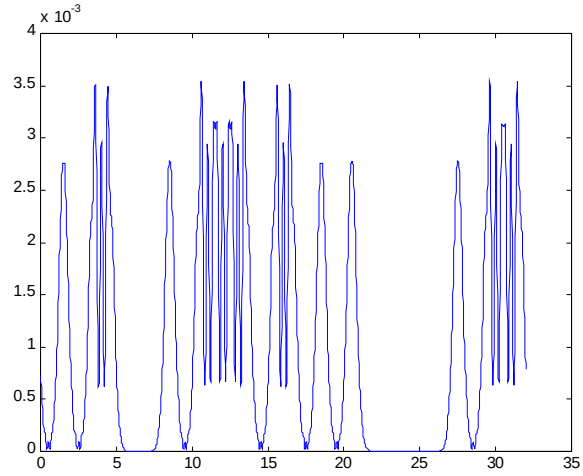
Solitoni 40 Gb/s su 300 km DS (D=0.1 ps/nm/km), Lamp=50 km.

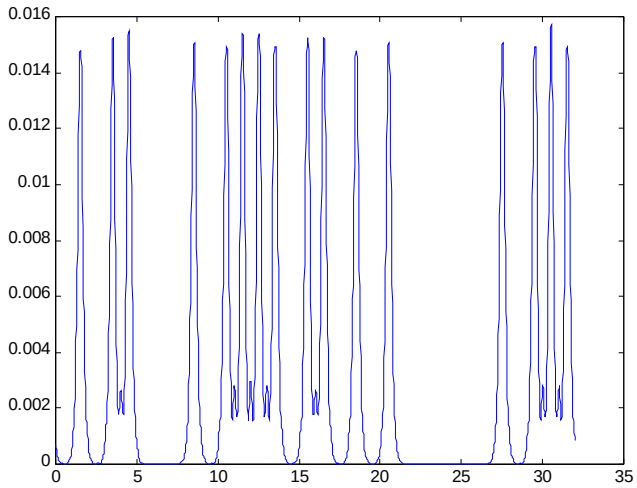
Potenza P=0.00001 (lineare)



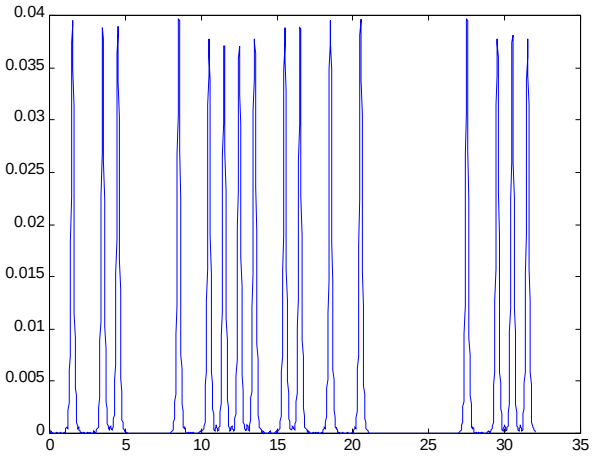
P=0.01W



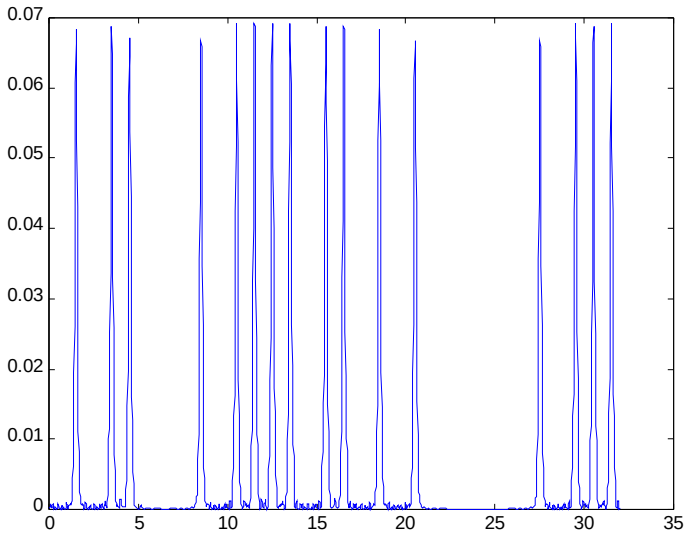
P=0.03 W



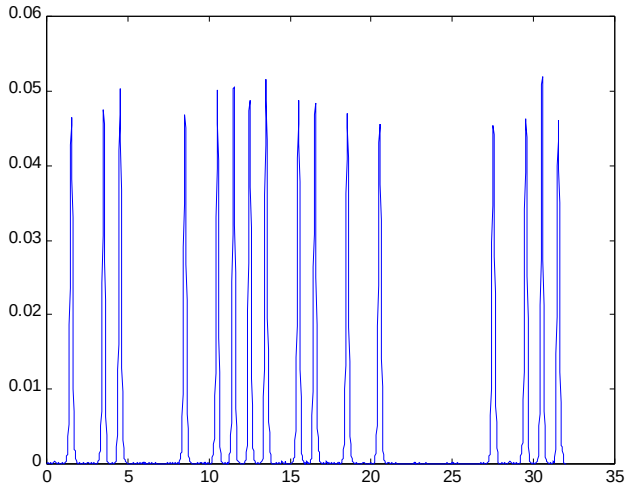
P=0.045 (Solitone)



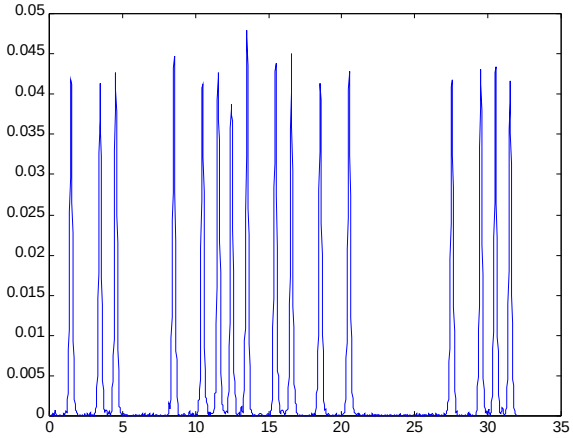
P=0.06



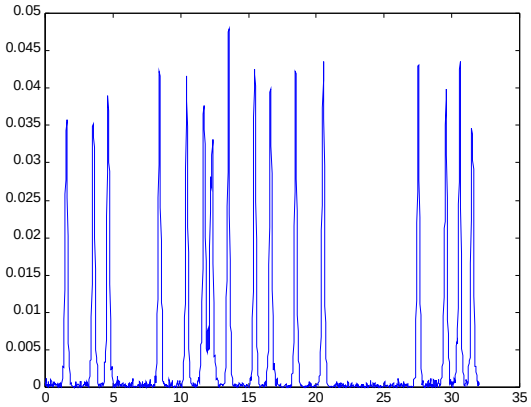
Solitone (P=0.045) dopo 700 km



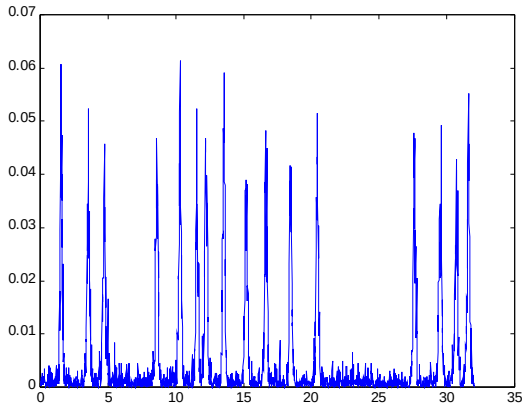
Dopo 1500 km



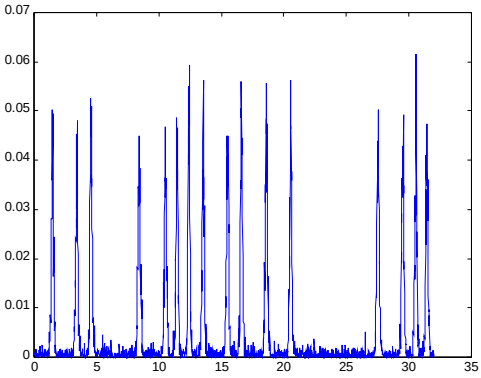
Dopo 3000 km

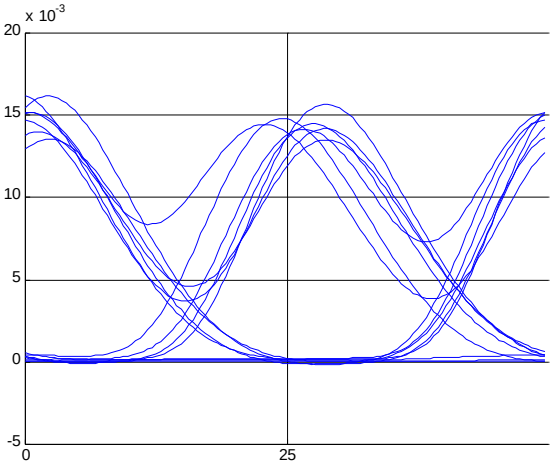


Con ASE

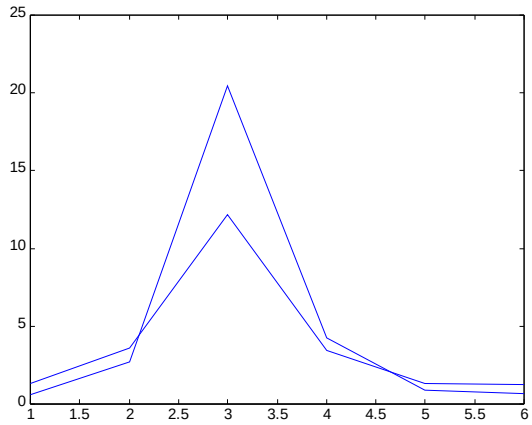


Dopo 2000 km con ASE





Fattore Q vs casi (n=3 è P=0.045)



```
%Calcola la statistica come media sui Q
%TRASMETTITORE
clear all

global lseq ncpb Tb numbits

   % PARAMETRI DI SISTEMA

   % PARAMETRI TRASMETTITORE
   TFWHM=0.005e-9 % durata impulso in secondi,
   numbits=32;
ncpb=64;
lseq = numbits * ncpb;        %ncpb = number of samples per bit
Tb = 0.025e-9;              %Tb= bit lenght in sec;  2.5Gbit/s <=> 0.4e-9; 10
Gbit/s <=> 0.1e-9
%spaziatura=0 %
canali=1;
deltaf=200e9; %spaziatura tra i canali in Hz
Pm=0;%non conta
extinction=1000; %non conta
M=1;  %ordine per i gaussiani, 1 convenzionale
%P1=0.0145; % in W
%P1=0.050; %in W
%P0=0;% attualmente non lavora
Ipmax=1;
Ism=1;
for Ip=1:Ipmax;
   for Is=1:Ism;
   P1=Ip*0.045;
seq32=[0 1 0 1 1 0 0 0 1 0 1 1 1 1 0 1 1 0 1 0 1 0 0 0 0 0 0 1 0 1 1 1];

seq = seq32;
nsigt=3;   %tipo di segnale 3=gauss, 2 solitone

Aisum = wdmf (P1, TFWHM, M, seq, nsigt, canali, deltaf);  %l'uscita è un campo
complesso
%osaN(Aisum, 1); %disegna lo spettro
Ain = equisgauss (P1, TFWHM, M, seq, nsigt);

%pezzo di fibra
%parametri fibra loss, Lfibrakm, disppsnmkm, gammawkm
loss=0.25;% in dB
Lfibrakm=50;% in km
disppsnmkm=0.1%.15625;
gammawkm=1.3;%2.7, 1.3
step=500; % 100 metri
beta3=0 %0.1e-39 %ps3/km
% Grating
     lossgr=0.0001; %in dB
     disppsnmgr=-78%-.15625 %in ps/nm, per passare da ps2 a ps/nm/km basta
dividere per -1.28.
     beta3gra=0;
 %    Aisum = grating(Aisum, lossgr, disppsnmgr, beta3gra, TFWHM);
     %fine grating

ispann=6;

for i=1:ispann;
   %Propagazione in fibra
   Aisum=fibraN(Aisum, loss, Lfibrakm, disppsnmkm, gammawkm, TFWHM, beta3,
step);

        % Grating
     lossgr=0.0001; %in dB
     disppsnmgr=-1562.5; %in ps/nm
```

```
     beta3gra=0%-10e-39;
     %Aisum = grating(Aisum, lossgr, disppsnmgr, beta3gra, TFWHM);
     %fine grating


    %Amplificatore ottico
         Gext=12.5;     %guadagno in dB
     muext=-60%6;    %cifra di rumore in dB, nsp=2 muext=6 dB
     Aisum =amplificatore(Aisum, Gext, muext);
     %fine amplificatore

  end

  % Grating
     lossgr=0.0001; %in dB
     disppsnmgr=78%-.15625 %in ps/nm, per passare da ps2 a ps/nm/km basta
dividere per -1.28.
     beta3gra=0;
%     Aisum = grating(Aisum, lossgr, disppsnmgr, beta3gra, TFWHM);
     %fine grating


  y=1:1:lseq
tty=y/ncpb;
Pout = (abs(Aisum)).^2 ;

plot(tty,Pout);
osaN(Aisum, 1);


% filtro ottico

bandanm=1;% in nm
if canali==1
modulazioneghz=0;
else
modulazioneghz=(deltaf/2)*1e-9;
end
Aisum = optrectfilter (Aisum, bandanm, modulazioneghz);
Ain = optrectfilter (Ain, bandanm, modulazioneghz);


I_noisepA = 0;
   Vin = fotodiodo(Aisum, I_noisepA);
   Vinref=fotodiodo(Ain, I_noisepA);
   %filtro elettrico
Vout = ricevitore(Vin);
Voutref = ricevitore(Vinref);




%DISEGNO DELL'OCCHIO
     cuteye=0;
     offset=0;
     numbeyes=2;
     titolo = 0;
     %if Is==1;
     eyeplot(Vout, cuteye, offset, numbeyes, titolo);
     %end

       %STIMA BER CON PATTERN
       delayx=0;%controllo fine del ritardo
       graphics=0
        [QSP, BERSP, Qpattern, BERmin]=Qfactp (Vout, Voutref, seq, delayx,
graphics)
        %        Qfa=Qfact(Vout, seq, delayx, 0)
```

```
        Q1S(Is)=QSP;
        BER1=BERSP;
        Q2S(Is)=Qpattern;
        BER2=BERmin;
        logoBERT(Ip)=log10(BER2);
    end % fine statistica su Ism cicli
    Q1M=0;
    Q2M=0;
    for Is=1:Ism
        QQ1=Q1S(Is)
        Q1M=Q1M+Q1S(Is)/Ism
        QQ2=Q2S(Is)
        Q2M=Q2M+Q2S(Is)/Ism
    end

    Q1X(Ip)=Q1M
    Q2X(Ip)=Q2M
        BER1=BERSP;
        %Q2(Ip)=Qpattern;
        BER2=BERmin;
        logoBERT(Ip)=log10(BER2);
end %fine cicli di potenza

y=1:Ipmax;
%plot(y,Q1X);
%hold on;
%plot(y,Q2X);
```