
TP2 Traitement de signal : Transformée de Fourier
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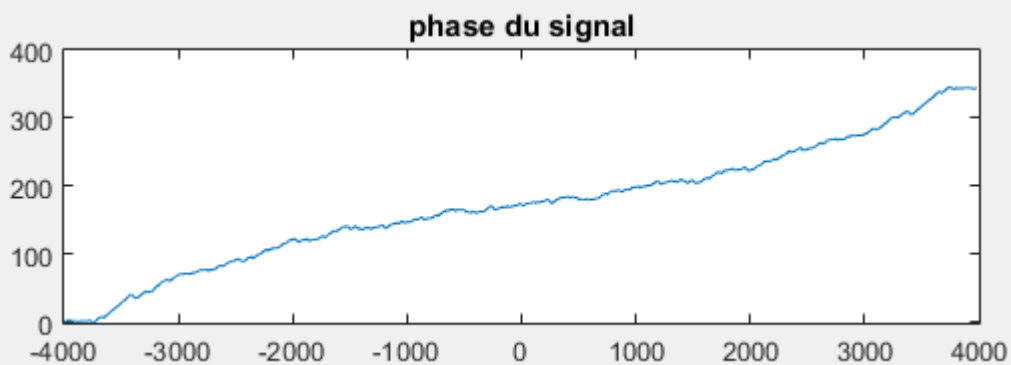
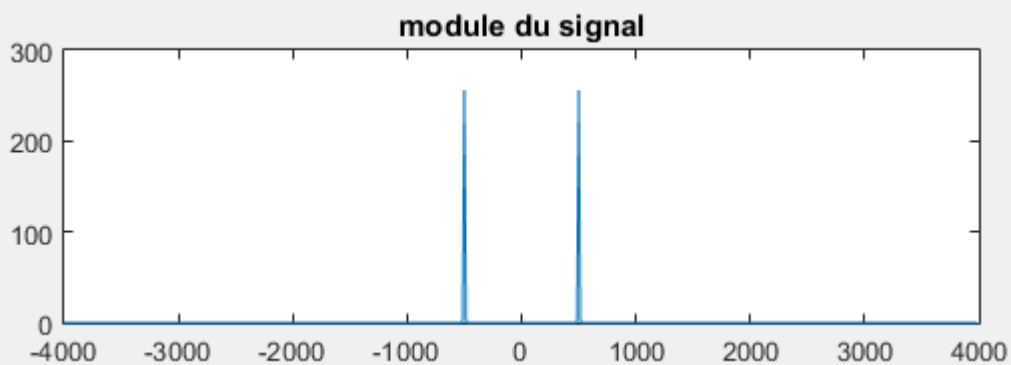
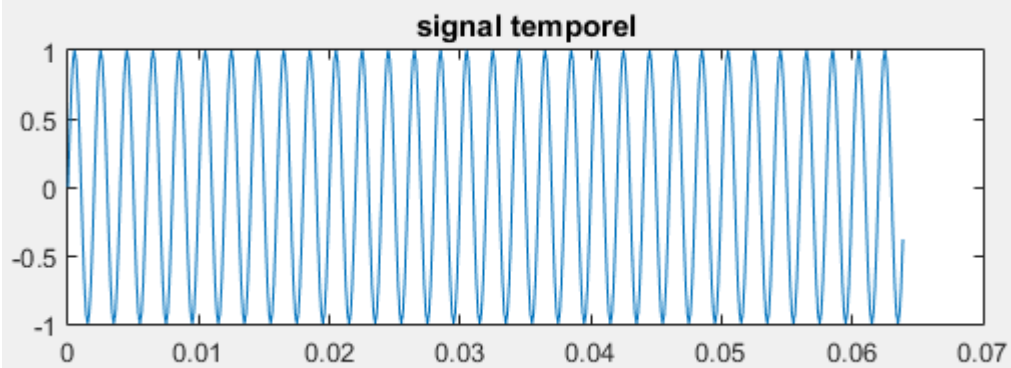
```
clear all; clc;
f0=500; fe=8000; Te=1/fe;
N=0.064.*fe; %N=512%

t=0:Te:(0.064-Te);
S= sin(2*pi*f0.*t);
X=fftshift(fft(S,N));% fe largeur du spectre ce n'est pas
le pas
subplot(3,2,1); plot(t,S); title('signal temporel');

subplot(3,2,2);
f=(-fe/2):(fe./N):((fe/2)-fe/N);
plot(f,abs(X));title('module du signal');

subplot(3,2,3);
plot(f,phase(X) ); title('phase du signal');
```

Name ▲	Value
f	1x512 double
f0	500
fe	8000
N	512
S	1x512 double
t	1x512 double
Te	1.2500e-04
X	1x512 complex double



Variation de N

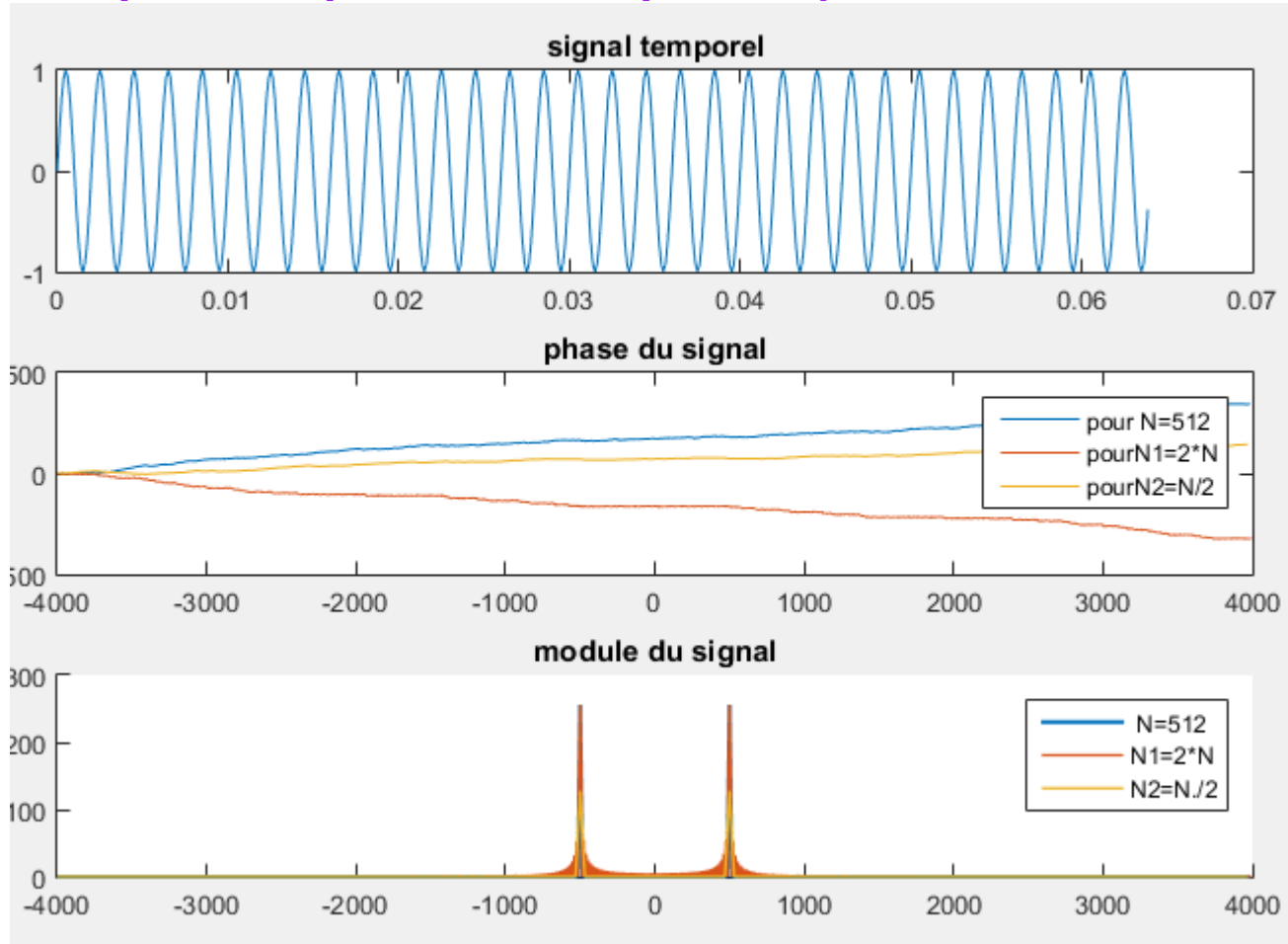
```
N1=2*N;  
N2=N./2;
```

```
X=fftshift(fft(S,N));% fe largeur du spectre ce n'est pas le pas%  
X1=fftshift(fft(S,N1));  
X2=fftshift(fft(S,N2));
```

```
f=(-fe/2):(fe./N):((fe/2)-fe/N);  
f1=(-fe/2):(fe./N1):((fe/2)-fe/N1);  
f2=(-fe/2):(fe./N2):((fe/2)-fe/N2);
```

```
figure(1);  
subplot(3,1,1); plot(t,S); title('signal temporel');
```

```
subplot(3,1,2);  
plot(f,phase(X),f1,phase(X1),f2,phase(X2));legend('pour  
N=512', 'pourN1=2*N', 'pourN2=N/2');title('phase du signal');
```

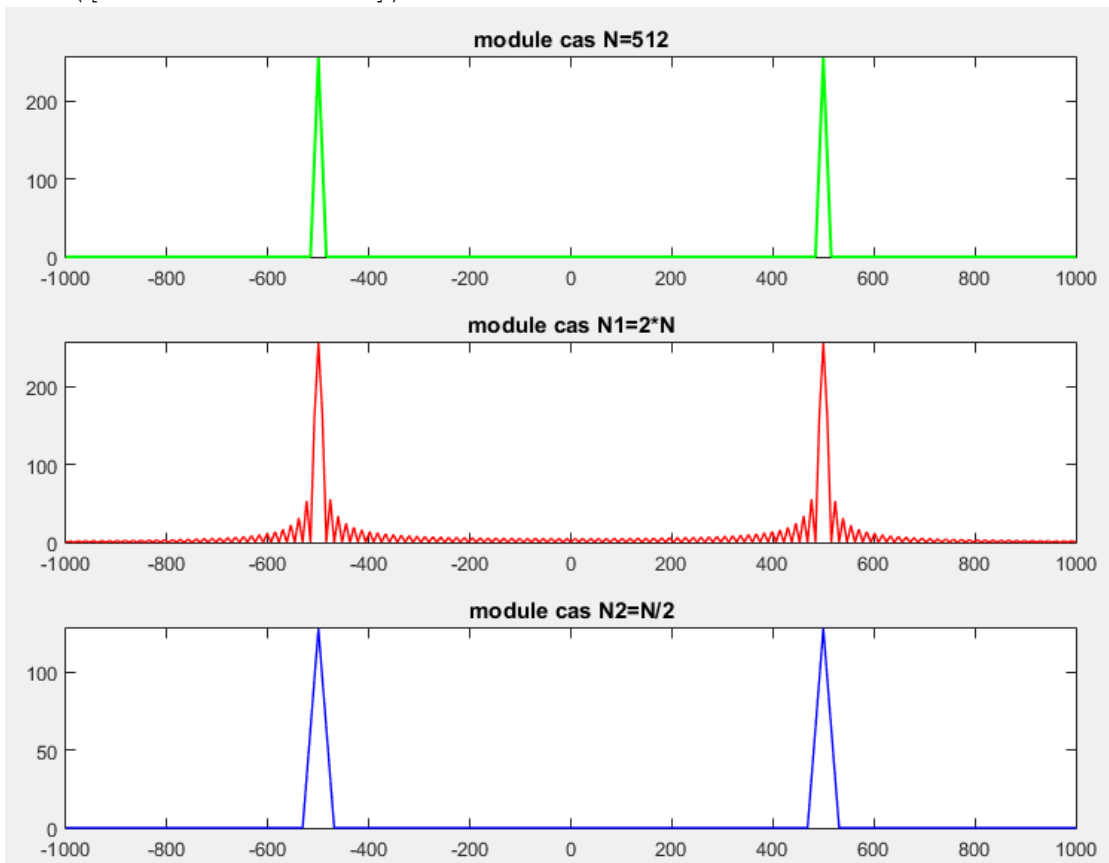


```
subplot(3,1,3);  
hold on ;  
plot(f,abs(X), 'LineWidth',1.5);  
plot(f1,abs(X1), 'LineWidth',1);  
plot(f2,abs(X2), 'LineWidth',1);  
legend(' N=512', 'N1=2*N', 'N2=N./2'); title('module du signal');  
hold off;
```

```
figure(2);  
subplot(3,1,1);  
plot(f,abs(X), 'g', 'LineWidth',1.5); title('module cas N=512');  
axis([-1000 1000 0 inf ])  
subplot(3,1,2);  
plot(f1,abs(X1), 'r', 'LineWidth',1);title('module cas N1=2*N');
```

```
axis([-1000 1000 0 inf ])
```

```
subplot(3,1,3);  
plot(f2,abs(X2),'b','LineWidth',1);title('module cas N2=N/2');  
axis([-1000 1000 0 inf ])
```



Pour $N2=2*N$ on remarque ds le spectre bilatéral l'apparition des harmoniques de forme sinuscardinal

TF Rectangle

```
figure(4);  
T1=0.02;  
NR=T1.*fe;  
R=rectpuls(t-(T1/2),T1);  
XR=fftshift(fft(R,NR));  
fr=(-fe/2):(fe./NR):((fe/2)-fe/NR);  
subplot(3,1,1);  
plot(t,R);title('signal rectangle');  
subplot(3,1,2);  
plot(fr,abs(XR));title('spectre  
module de rectangle');  
subplot(3,1,3);  
plot(fr,phase(XR));title('spectre  
phase de rectangle');
```

