

Report on Resampling Procedure - 2

SF - 12-2-2007

TITLE	1
Creates a gd (a data object) with a white gaussian noise.....	1
Low-pass the original data (band 0-2000 Hz)	1
Resamples the data at 4000 Hz.....	2
Resamples the data at 4096 Hz.....	2
Power spectra	3
Resamples the data 4096 Hz at 4000 Hz and take the difference.....	5

TITLE

```
% Report on Resampling Procedure - 2
```

```
% In rep_res_2
```

Creates a gd (a data object) with a white gaussian noise

```
fr0=20000;  
N0=fr0*10;  
N1=N0/10;  
gln=gd_noise('amp', 1, 'len', N0, 'dt', 1/fr0)
```

```
gd gin -> n=200000 ini=0 dx=5.000000e-005 type=1 -> gaussian noise
```

Low-pass the original data (band 0-2000 Hz)

```
g=y_gd(gln);  
g=fft(g);  
g(N1+1:N0)=0;  
g(N1-9:N1)=g(N1-9:N1).*(10:-1:1)/10;  
g(N0:-1:N0-N1+2)=conj(g(2:N1));  
g=ifft(g);  
gln1=gln;
```

```
gln1=edit_gd(gln1, 'y', g, 'capt', 'low-pass original data');
```

Resamples the data at 4000 Hz

The 200000 data are divided in pieces of 2 s (40000 data each). The junction is every 2 s.

```
gout4000=gd_resampling(gln1, 1/4000, 2^15)
```

```
nsec =
```

```
2
```

```
ndat1 =
```

```
40000
```

```
gd gout4000 -> n=40000 ini=0 dx=2.500000e-004 type=1 -> resampled data
```

Resamples the data at 4096 Hz

The 200000 data are divided in pieces of 2 s (40000 data each). The junction is every 2 s.

```
gout4096=gd_resampling(gln1, 1/4096, 2^15)
```

```
figure, plot(gln1, 'g', gout4000, 'bo', gout4096, 'r+'); grid on
```

```
xlim([1.995 2.005])
```

```
xlabel('seconds')
```

```
title('original low-pass, 4000 Hz (blue o) and 4096 data (red +)')
```

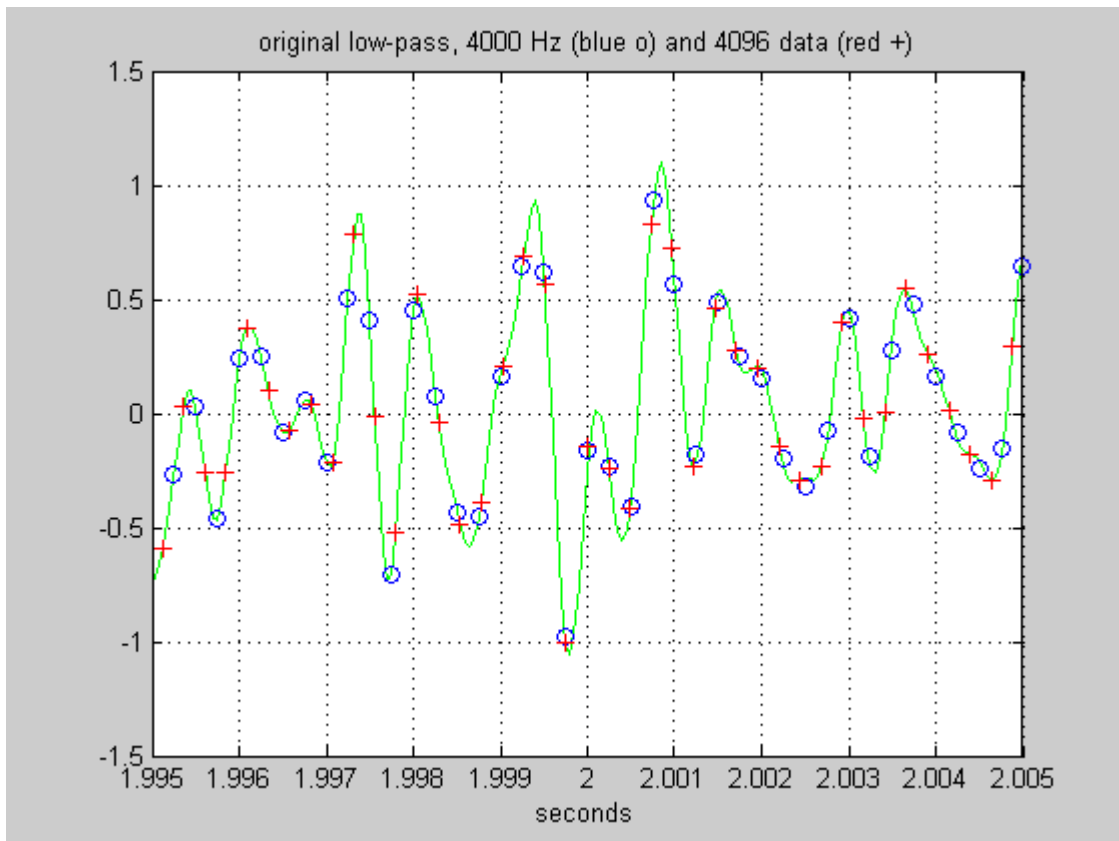
```
nsec =
```

```
2
```

```
ndat1 =
```

```
40000
```

```
gd gout4096 -> n=40960 ini=0 dx=2.441406e-004 type=1 -> resampled data
```



Power spectra

```
sout4000=gd_pows(gout4000, 'window', 2, 'short')
```

```
sout4096=gd_pows(gout4096, 'window', 2, 'short')
```

```
si n1=gd_pows(gi n1, 'window', 2, 'short')
```

```
figure, semi logy(si n1, 'g', sout4096, 'r', sout4000, 'b'); grid on
```

```
xlabel (' Hz')
```

```
title(' Power spectra: original low-pass, 4000 Hz (blue) and 4096 data (red)')
```

```
figure, semi logy(si n1, 'g', sout4096, 'r', sout4000, 'b'); grid on
```

```
xlim([1985 2010])
```

```
ylim([1e-9 1e-3])
```

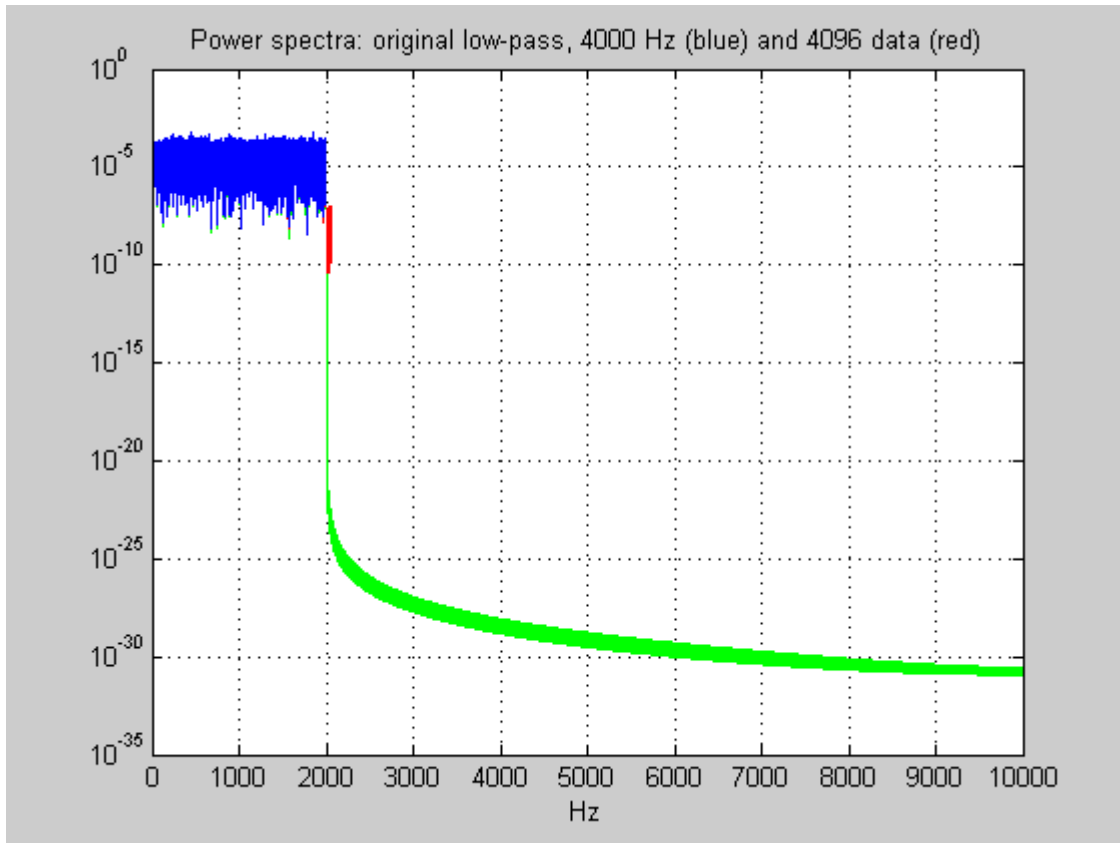
```
xlabel (' Hz')
```

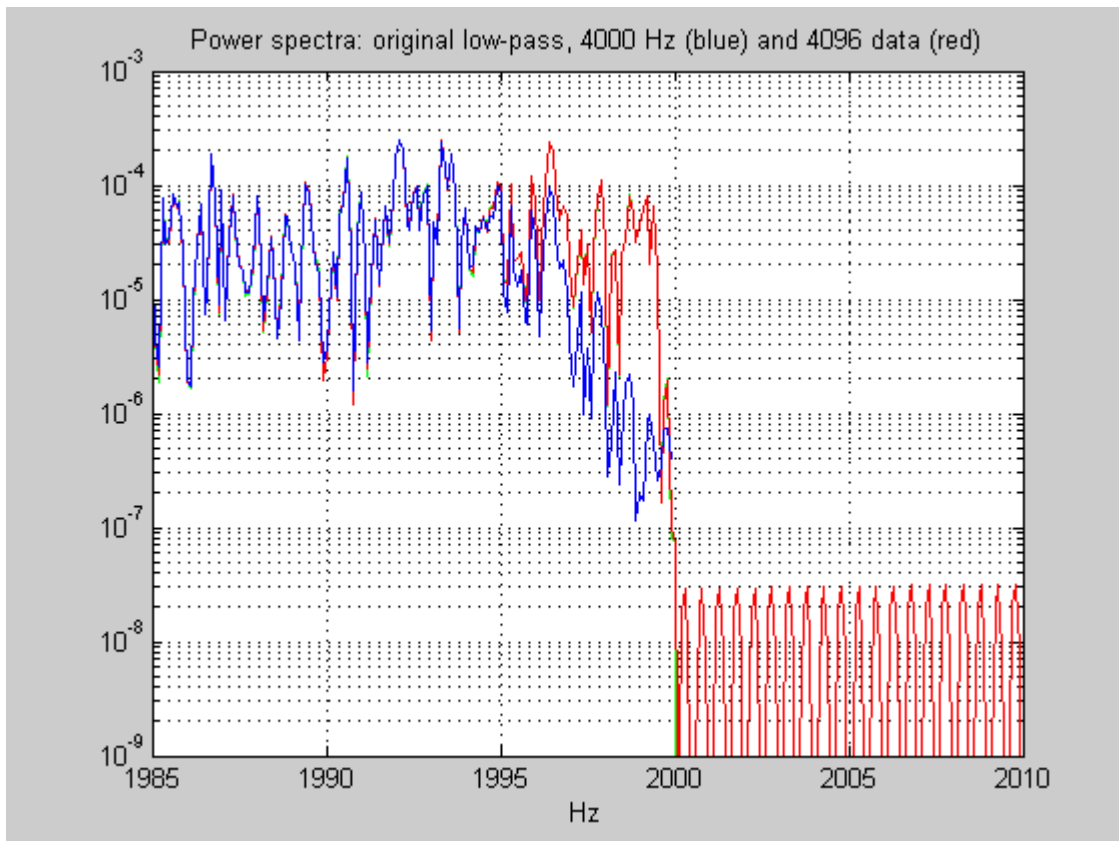
```
title(' Power spectra: original low-pass, 4000 Hz (blue) and 4096 data (red)')
```

gd sout4000 -> n=20000 ini=0 dx=1.000000e-001 type=1 -> power spectrum of: resampled data

gd sout4096 -> n=20480 ini=0 dx=1.000000e-001 type=1 -> power spectrum of: resampled data

gd sin1 -> n=100000 ini=0 dx=1.000000e-001 type=1 -> power spectrum of: low-pass original data





Resamples the data 4096 Hz at 4000 Hz and take the difference

```
gout4096a=gd_resampling(gout4096, 1/4000, 2^11)
```

```
diff=gout4096a-gout4000
```

```
figure, plot(diff), grid on
```

```
title('Difference of 4 kHz and 4096 Hz data res. at 4kHz')
```

```
xlabel('s')
```

```
nsec =
```

```
2
```

```
ndat1 =
```

```
8192
```

```
gd gout4096a -> n=40000 ini=0 dx=2.500000e-004 type=1 -> resampled data
```

```
gd diff -> n=40000 ini=0 dx=2.500000e-004 type=1 -> gout4096a-gout4000
```

```
ans =
```

```
2.9630e+003
```

