Table of Contents


```
clear all; clc;
```

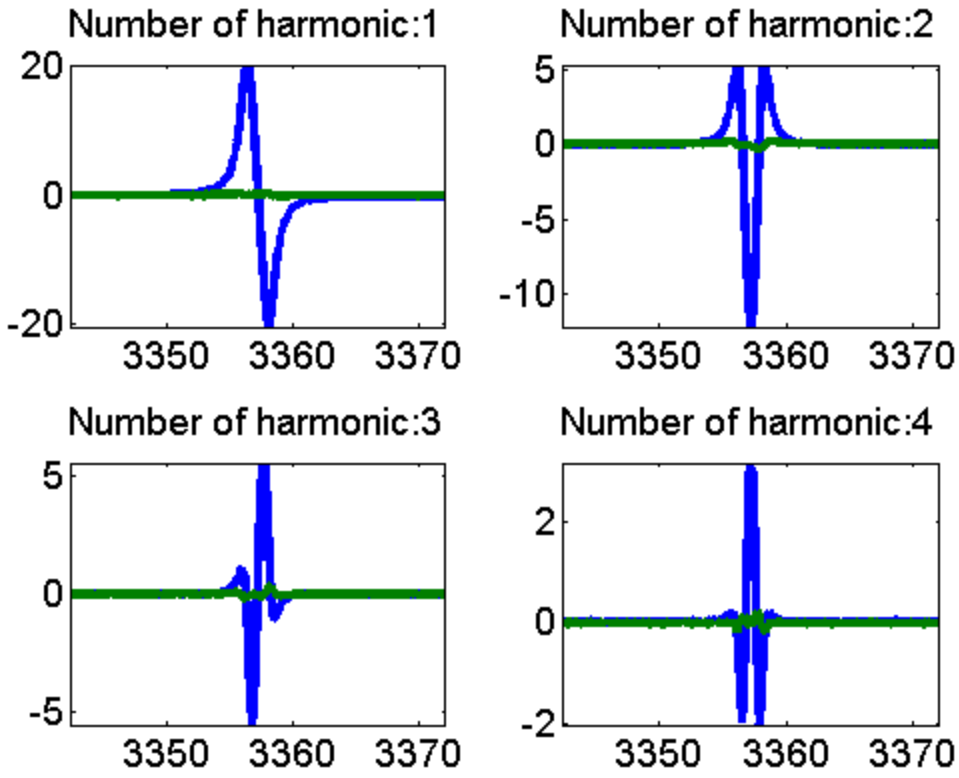
read data from file

```
file_name='19_spu_BDPA_040313.dsc';
[h,Y,N,Hpp,Fm] = readBES3Tm(file_name);
% h - magnetic field vector [G]
% N - total number of spectra  in & out of phase
% Hpp - modulation amplitude [G]
% Fm - modulation frequency
```

manual phase correction

we take only real part; in ideal case imaginary part = zero.

```
ph=1.6; % adjustable phase in degrees
Yc=Y(1:2: end,:)+1i*Y(2:2: end,:); % quadrature complex signal
   for k=1:4
        subplot(2,2,k);
        set(gca,'FontSize',14)
        sp=Yc(k,:)*exp(1i*k*ph/180*pi);
        plot(h,real(sp),h,imag(sp),'linewidth',3);
        tx=['Number of harmonic:' num2str(k)];  title(tx);
        axis tight
   end
 Yc=real(Yc);  % we remove imaginary part
```

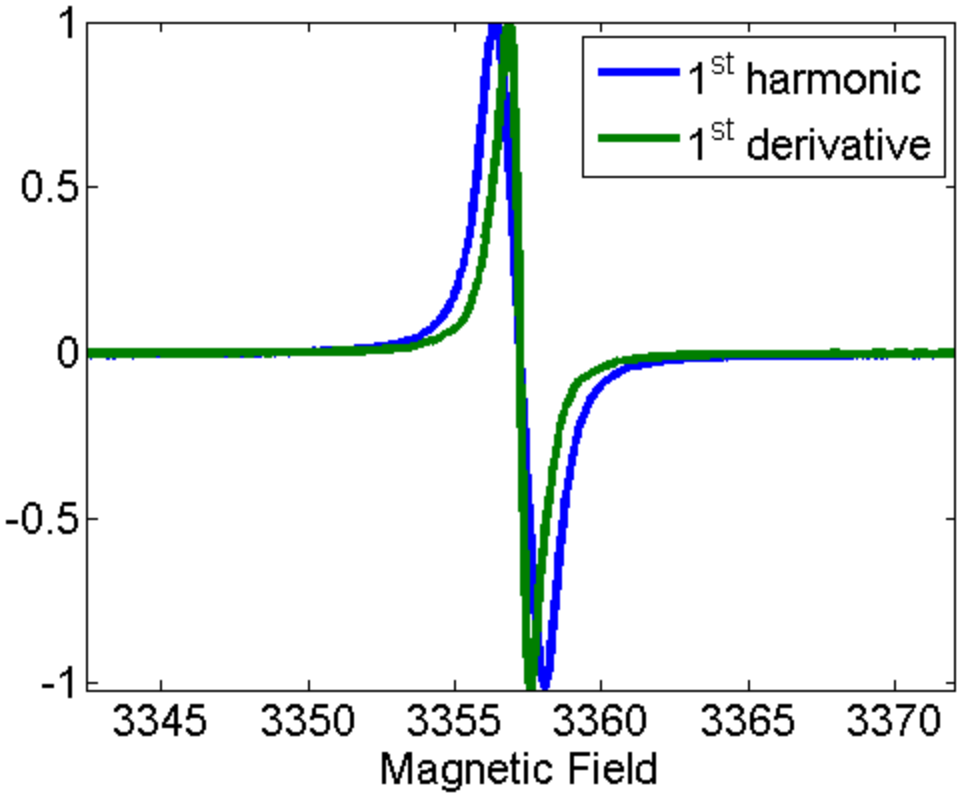


Reconstruction

```
cutoff=2*Hpp; % [G]
filter_width=0.4; % [G]

z = multiHarmonic(h,Hpp,Yc,cutoff,filter_width); % recovered  1st derivative
% cutoff - in [G] units; filter threshold
% filter_width -in [G] units, Gaussian filter
% h - magnetic field vector
% Hpp - modulation amplitude [G]
% Yc - 2D array with spectra
% cutoff must be of the order of modulation amplitude; reduces overall noise
% filter _width is of the order and smaller than the undistorted linewidth; reduce
```

Show results

```
subplot(1,1,1);
set(gca,'FontSize',16);

y1=Y(1,:); % raw data 1st harmonic signal
plot(h,y1/max(y1),h,z/max(z),'linewidth',3);
axis tight;

legend('1^s^t harmonic','1^s^t derivative');
xlabel 'Magnetic Field'
```



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