

```

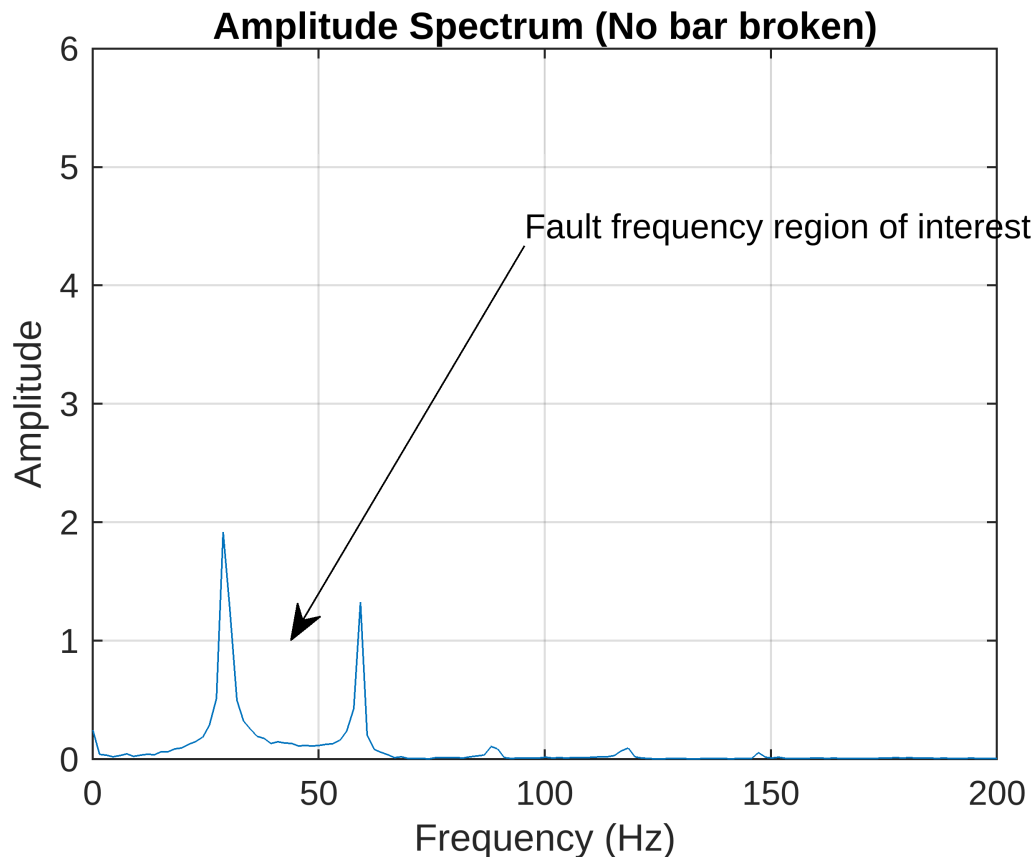
data= readtable('r0b_torque10_exp01_vibration.xlsx');
vibData = data.Vib_base;

Fs = 7600;
N = length(vibData);
X = fft(vibData);
f = (0:N-1)*(Fs/N);

P1 = abs(X(1:floor(N/2)+1))/N;
f1 = f(1:floor(N/2)+1);

figure;
plot(f1, P1)
axis([0 200 0 6])
xlabel('Frequency (Hz)')
ylabel('Amplitude')
title('Amplitude Spectrum (No bar broken)')
annotation("textarrow", [0.5 0.3], [0.7 0.25], "String", "Fault frequency
region of interest")
grid on;

```



```

data= readtable('r2b_torque10_exp01_vibration.xlsx');
vibData = data.Vib_base;

```

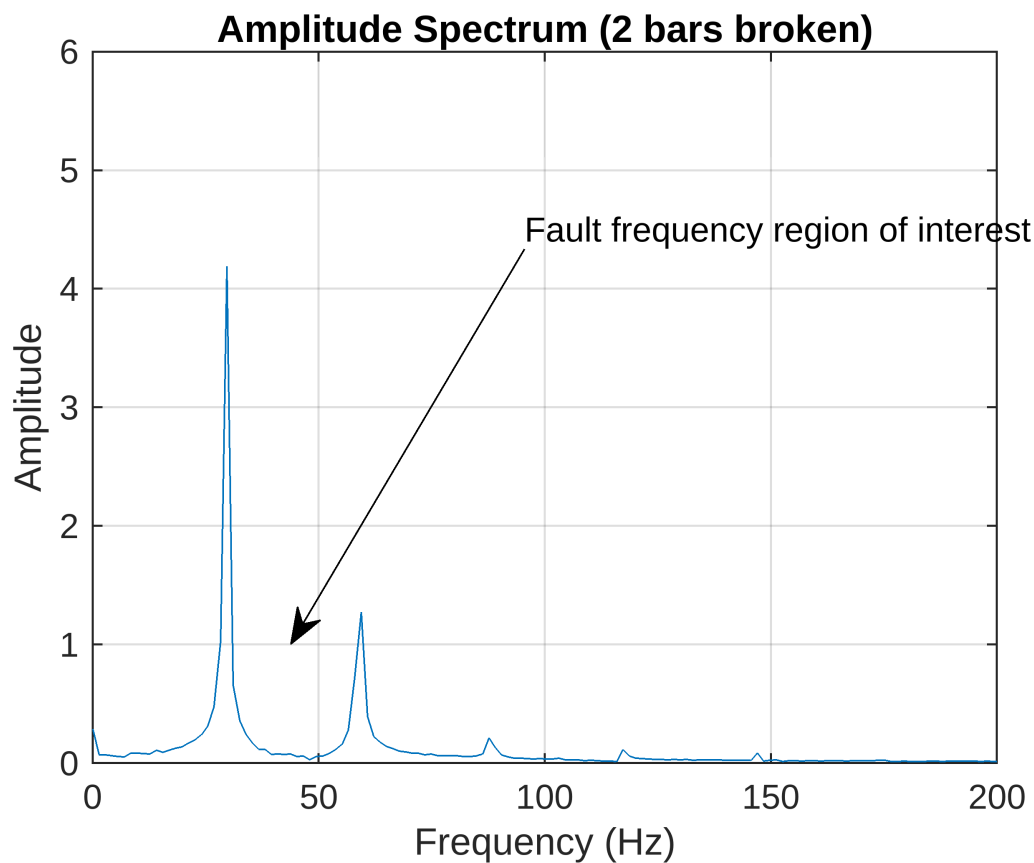
```

Fs = 7600;
N = length(vibData);
X = fft(vibData);
f = (0:N-1)*(Fs/N);

P1 = abs(X(1:floor(N/2)+1))/N;
f1 = f(1:floor(N/2)+1);

figure;
plot(f1, P1)
axis([0 200 0 6])
xlabel('Frequency (Hz)')
ylabel('Amplitude')
title('Amplitude Spectrum (2 bars broken)')
annotation("textarrow", [0.5 0.3], [0.7 0.25], "String", "Fault frequency
region of interest")
grid on;

```



```

data= readtable('r4b_torque10_exp01_vibration.xlsx');
vibData = data.Vib_base;

Fs = 7600;
N = length(vibData);
X = fft(vibData);
f = (0:N-1)*(Fs/N);

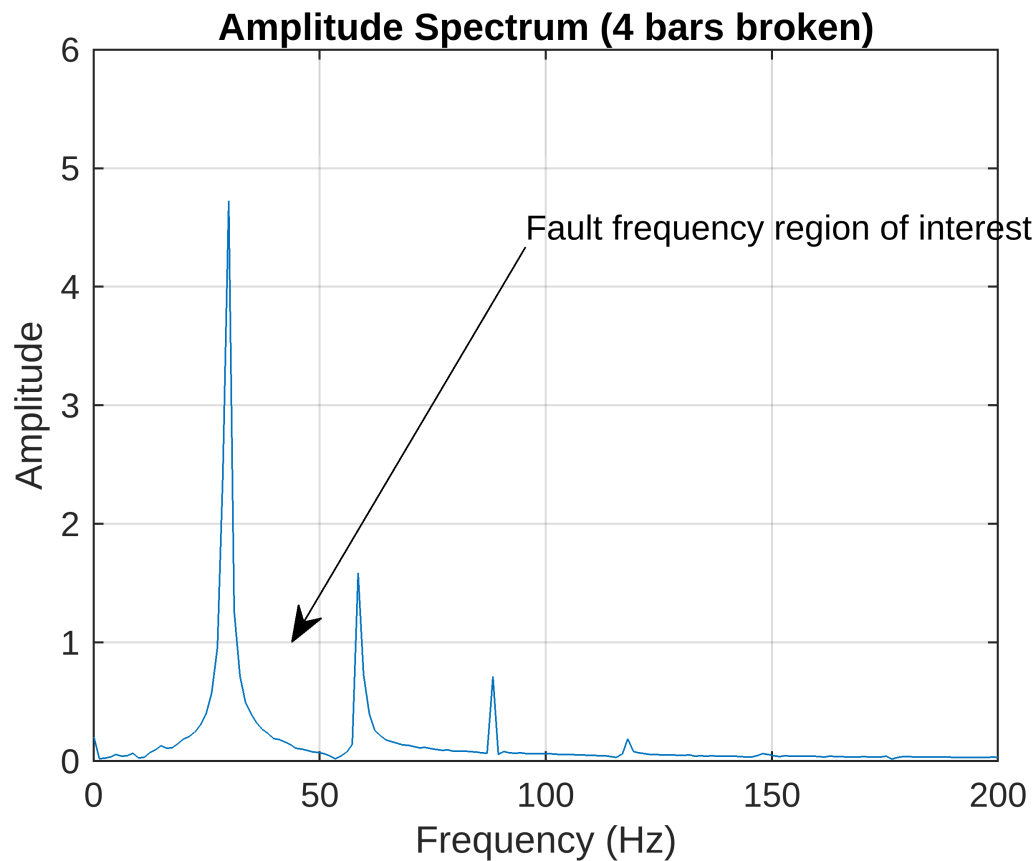
```

```

P1 = abs(X(1:floor(N/2)+1))/N;
f1 = f(1:floor(N/2)+1);

figure;
plot(f1, P1)
axis([0 200 0 6])
xlabel('Frequency (Hz)')
ylabel('Amplitude')
title('Amplitude Spectrum (4 bars broken)')
annotation("textarrow", [0.5 0.3], [0.7 0.25], "String", "Fault frequency region of interest")
grid on;

```



```

% Reduced dataset
data= readtable('r0b_torque10_512_exp01_vibration.xlsx');
vibData = data.Vib_base;

Fs = 7600;
N = 512;
X = fft(vibData);
f = (0:N-1)*(Fs/N);

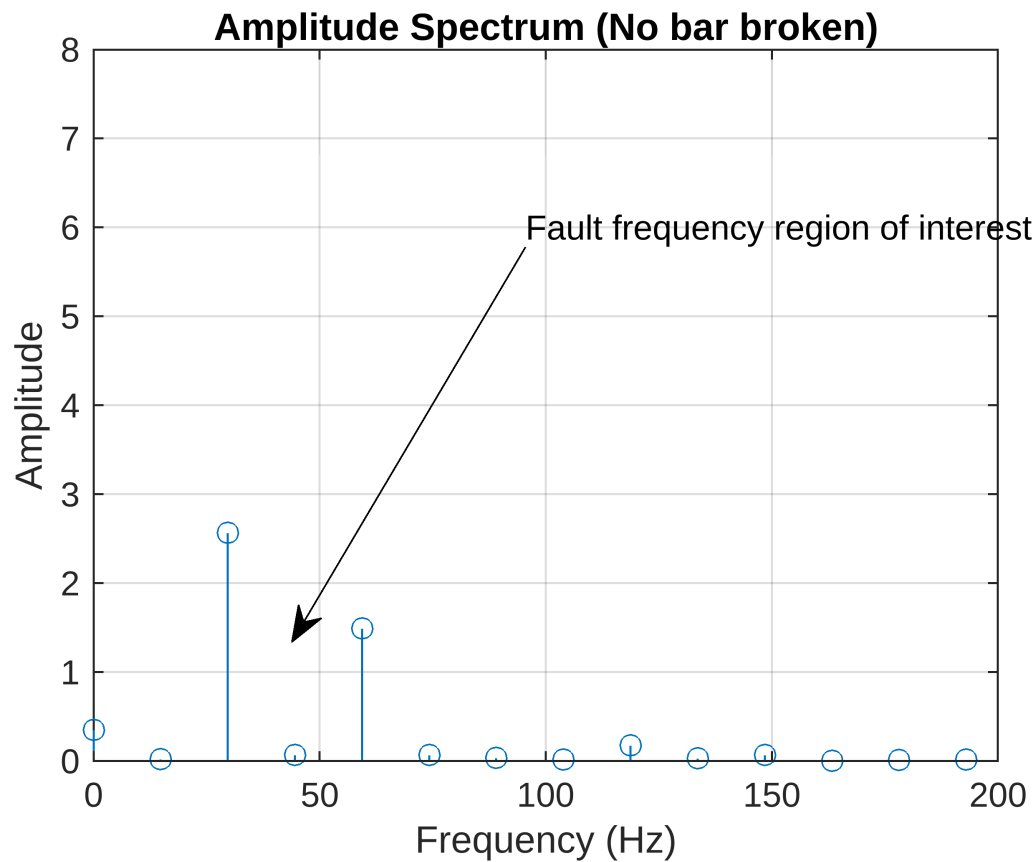
```

```

P1 = abs(X(1:(N/2)+1))/N;
f1 = f(1:(N/2)+1);

figure;
stem(f1, P1)
axis([0 200 0 8])
xlabel('Frequency (Hz)')
ylabel('Amplitude')
title('Amplitude Spectrum (No bar broken)')
annotation("textarrow", [0.5 0.3], [0.7 0.25], "String", "Fault frequency  
region of interest")
grid on;

```



```

data= readtable('r2b_torque10_512_exp01_vibration.xlsx');
vibData = data.Vib_base;

Fs = 7600;
N = 512;
X = fft(vibData);
f = (0:N-1)*(Fs/N);

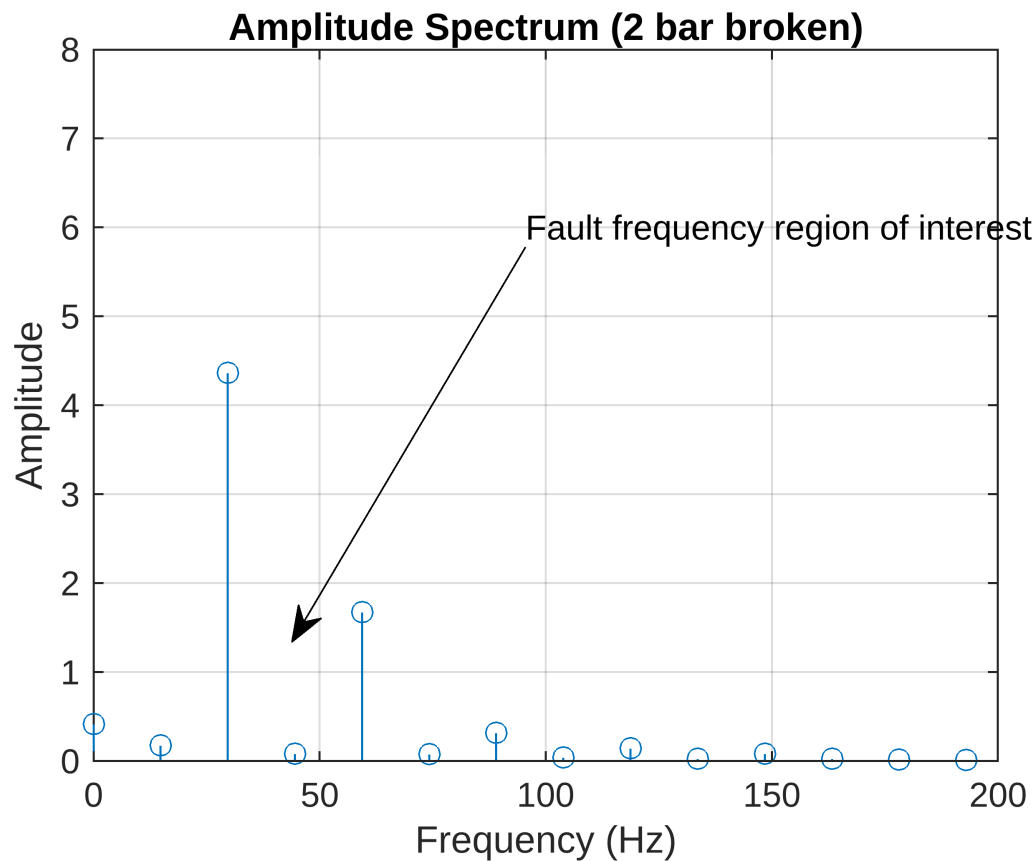
P1 = abs(X(1:(N/2)+1))/N;
f1 = f(1:floor(N/2)+1);

```

```

figure;
stem(f1, P1)
axis([0 200 0 8])
xlabel('Frequency (Hz)')
ylabel('Amplitude')
title('Amplitude Spectrum (2 bar broken)')
annotation("textarrow", [0.5 0.3], [0.7 0.25], "String", "Fault frequency  
region of interest")
grid on;

```



```

data= readtable('r4b_torque10_512_exp01_vibration.xlsx');
vibData = data.Vib_base;

Fs = 7600;
N = 512;
X = fft(vibData);
f = (0:N-1)*(Fs/N);

P1 = abs(X(1:(N/2)+1))/N;
f1 = f(1:floor(N/2)+1);

figure;

```

```

stem(f1, P1)
axis([0 200 0 8])
xlabel('Frequency (Hz)')
ylabel('Amplitude')
title('Amplitude Spectrum (4 bar broken)')
annotation("textarrow", [0.5 0.3], [0.7 0.25], "String", "Fault frequency  
region of interest")
grid on;

```

