

#1283: HyperGraph – Convert time domain to frequency domain

Product: HyperGraph

Product Version: HyperGraph 12.0 or above

Topic Objective

Convert time domain to frequency domain using HyperGraph.

Topic Details

A typical example considered to convert time domain to frequency domain.

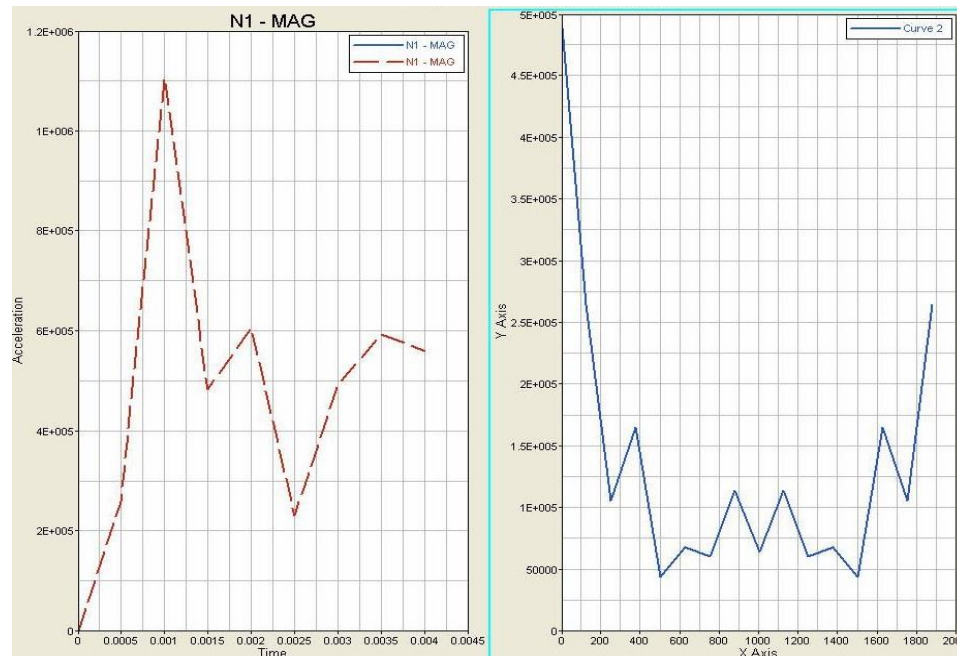
Please follow the following steps to convert the Time vs Acceleration table to Frequency vs Acceleration.

1. Plot the Time vs Acceleration curve using the build plots panel.
2. Select 2 window page layout.
3. Make the second window active by clicking on it.
4. Go to Define curves panel and add a curve.
5. Now with the 2nd window active switch the radio button from file to math.
6. Click the X= box and then click on the frequency button "freq()", then place the cursor within the brackets and press and hold the shift key & select the curve from the 1st window (p1w1c1.x) or you can select the same from
7. Again click the Y= box and then select curve window (p1w1c1.y) using curves.
8. Now, click on apply to get the curve Freq vs Acceleration.

Using FFT

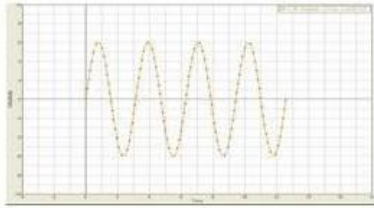
Add on for the point 7.

Again, click the Y= box and then select FFT and select the curve window (p1w1c1.y) using curves.



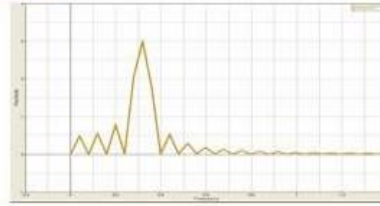
Please note its obvious that we can expect a change in amplitude when we do the conversions from time domain to frequency domain.

Time and Frequency equivalence

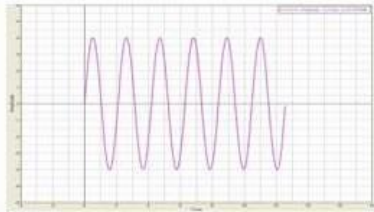


X-Axis: Amplitude, Y-Axis: $Y = A \sin(\omega t)$, $A=6$ and $f=0.318471337$

FFT
→

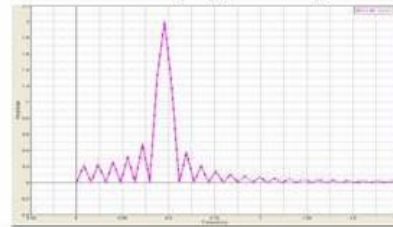


X-Axis: Frequency, Y-Axis: Amplitude

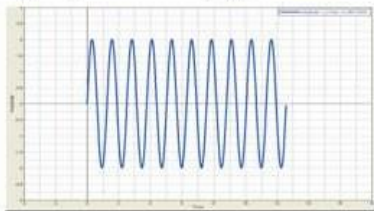


X-Axis: Amplitude, Y-Axis: $Y = A \sin(\omega t)$, $A=4$ and $f=0.477707006$

FFT
→



X-Axis: Frequency, Y-Axis: Amplitude

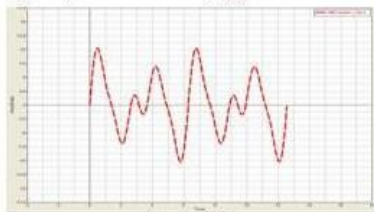


X-Axis: Amplitude, Y-Axis: $Y = A \sin(\omega t)$, $A=2$ and $f=0.796178343$

FFT
→



X-Axis: Frequency, Y-Axis: Amplitude



Complex Wave

FFT
→



X-Axis: Frequency, Y-Axis: Amplitude