# Cantilever Beam Modal Analysis - Exercises

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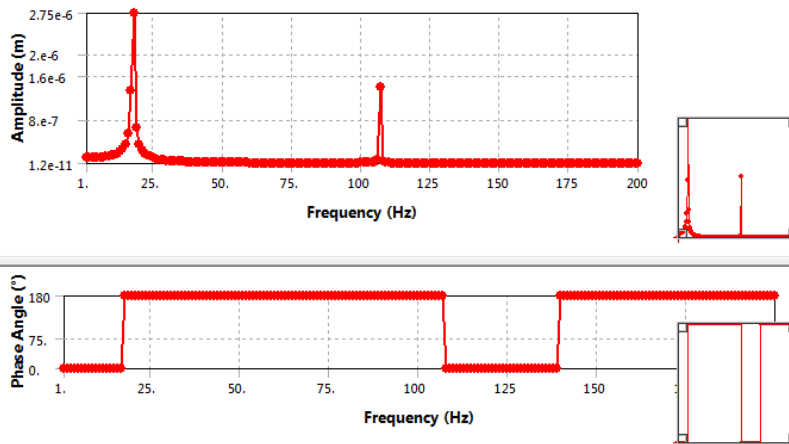# Exercises

### Analyze Harmonic Response of Beam

We would like to examine the response of the beam to a sinusoidal forcing function over a wide range of frequencies, and obtain a Bode plot of the response.

### Tips

Return to the main Project window. Drag a Harmonic Response system onto the Geometry cell of your Modal System. Double Click on the Model cell in your Harmonic Response system, and setup the mesh as before. In addition to the Fixed Support and Displacement boundary conditions we had before, we will also need to apply a Force. In the tree, Right Click Harmonic Response > Insert > Force. Select the right end of the beam, and apply the force. Under Definition, change Define By to Components and set the y component to 1N. Under Harmonic Response, select Analysis Settings. Here we can define the frequency range and intervals we would like. Next, Right Click Solution > Insert > Frequency Response > Deformation. This will give us a Bode plot of the Frequency Response. Under 'Details of Frequency Response', change 'Orientation' to 'y-axis'.

The following Bode Plot was obtained for a frequency range of 0-200 Hz, 200 intervals and a 1N force in the y direction using the Geometry of the Cantilever Beam-Modal Analysis tutorial.



### HW 10 For Cornell MAE 4770/5770 Students

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