Lab Notebook
METC-143

08/01/2013

Lab #8
Cantilever Frequency
7/30/13

Hypothesis:

The frequency similar material decreases as the thickness of the material increases.

Equipment:

- Camera
- Tripod
- Card Reader
- 4- Clamps
- Poster Board Strip with horizontal reference lines
- Poster Board strip 24" x 2.375 x .125
- Poster Board strip 24" x 1.25 x .25
- Computer

Procedure:

1. Clamp a poster board strip to the table top and position the poster board with horizontal lines parallel
2. Set up a video camera on a tripod to capture video of the oscillations of the cantilevered poster board strip.
3. Use the captured video count the number of oscillations over a 5 second interval of the video.
4. Set up a spreadsheet to determine the frequency of the board.
5. Repeat for a similar strip that is thicker.
6. Compare the results.

Lab #8 continued

Formula:
f=((#oscillations)*(frames/second))/(#frames)

Camera Frame/ Second=		30	length=	9 7/16	inches
			width=	2 3/8	inches
			thickness=	0.125	inches
Units Added		#Oscilatio	Frames	Frequency	
	0	24.5	150	4.90000	Hz
	1	19	150	3.80000	Hz
	2	16	150	3.20000	Hz
	3	15	150	3.00000	Hz
	4	12	150	2.40000	Hz
	5	11	150	2.20000	Hz
	6	9.5	150	1.90000	Hz
	7	8.5	150	1.70000	Hz
	8	7	150	1.40000	Hz
	9	5.5	150	1.10000	Hz
	10	4	150	0.80000	Hz

Frequency for Thinner Material

3
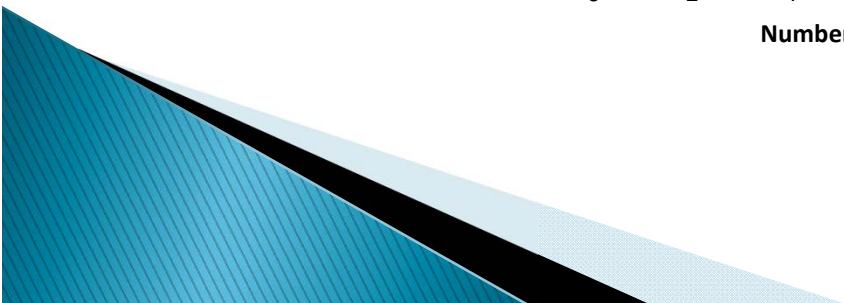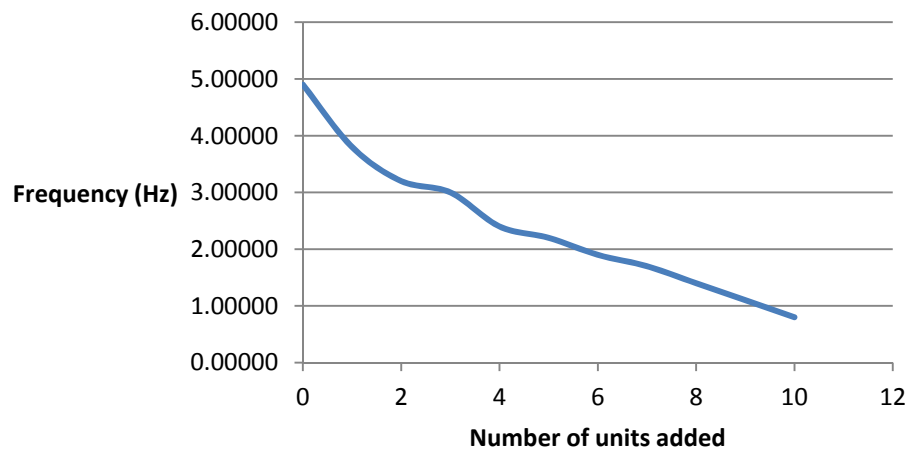
Lab #8 continued

Camera Frame/ Second=		30	length=	9 7/16	inches
			width=	1 1/4	inches
			thickness=	0.250	inches
Units Added		#Oscilatio	Frames	Frequency	
0		19	150	3.80000	Hz
1		15	150	3.00000	Hz
2		14	150	2.80000	Hz
3		13	150	2.60000	Hz
4		12	150	2.40000	Hz
5		11	150	2.20000	Hz
6		10	150	2.00000	Hz
7		9	150	1.80000	Hz
8		8	150	1.60000	Hz
9		7	150	1.40000	Hz
10		6	150	1.20000	Hz

Frequency for Thicker Material

Frequency (Hz)
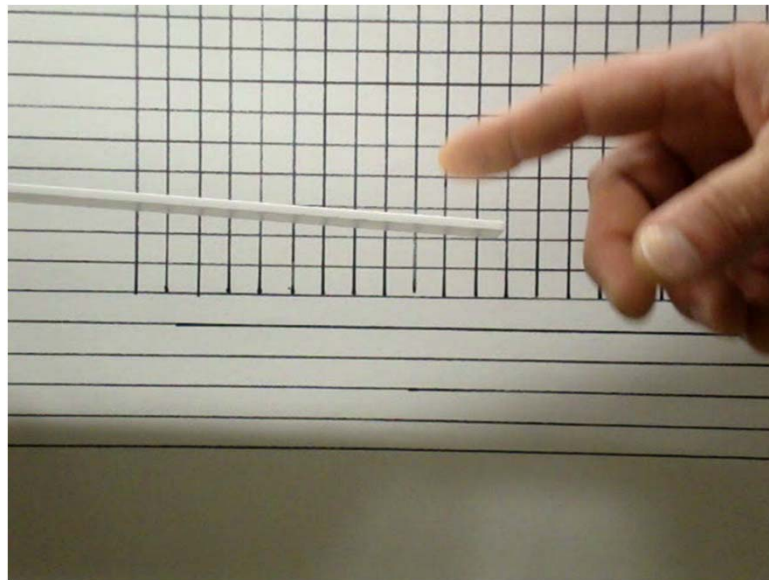
Number of units added
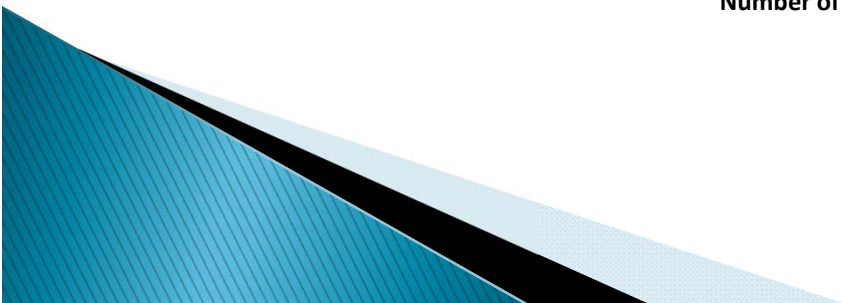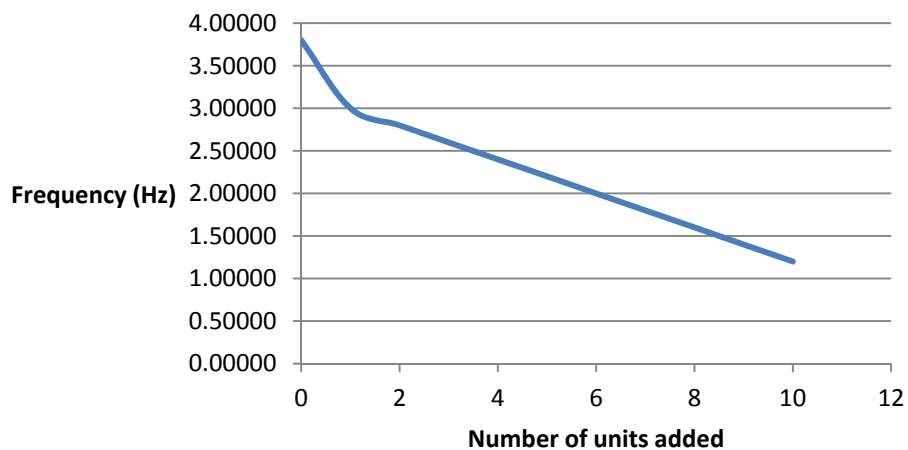
Lab #8 continued

Observations:

     While the thicker board was narrower it did not seem to matter

Conclusion:

     The thicker the material is the lower the frequency of the cantilever.

Video of Test of Thinner Material without any units added