

# Low Pass

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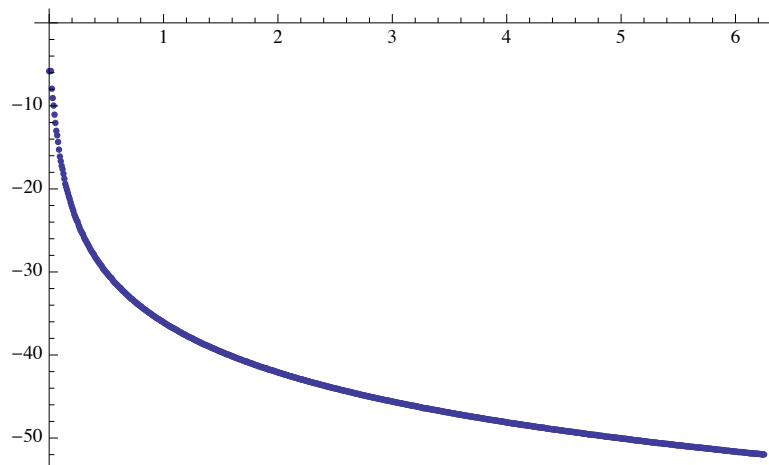
```
SetDirectory["/Users/larisathorne/Documents/Rana:LIGO Caltech"]  
/Users/larisathorne/Documents/Rana:LIGO Caltech  
FrequencyGain = ReadList["lowpass1.txt", {Number, Number}];  
FrequencyPhase = ReadList["lowpass2.txt", {Number, Number}];
```

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## Frequency versus Gain :

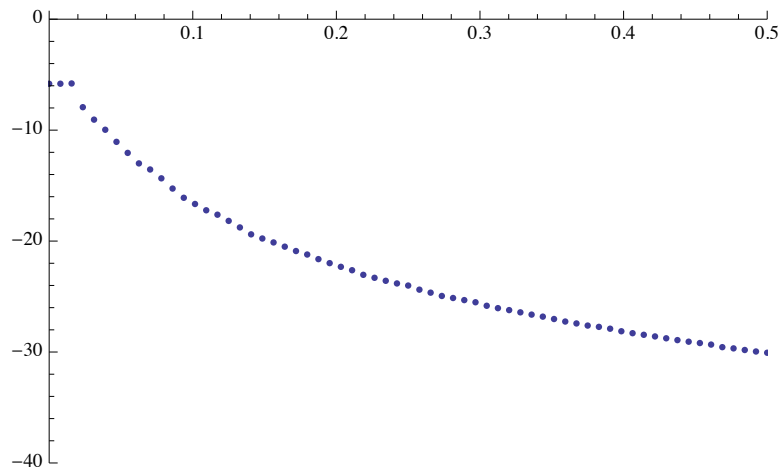
- Let the x axis be the frequency (Hz)
- Let the y axis be the corresponding Gain

ListPlot[FrequencyGain]



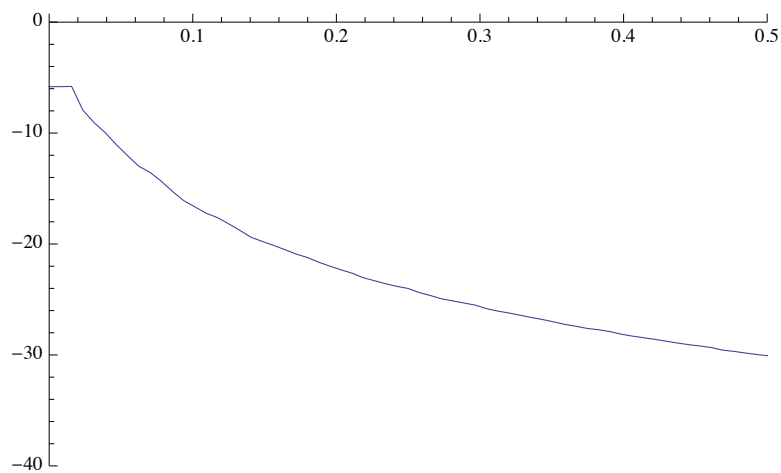
Zoom in to area of interest : cutoff frequency for component configuration is set to occur at 0.1 Hz

```
ListPlot[FrequencyGain, PlotRange -> {{0, 0.5}, {-40, 0}}]
```



Final zoomed in, smooth line plot.

```
ListPlot[FrequencyGain, PlotRange -> {{0, 0.5}, {-40, 0}}, PlotJoined -> True]
```

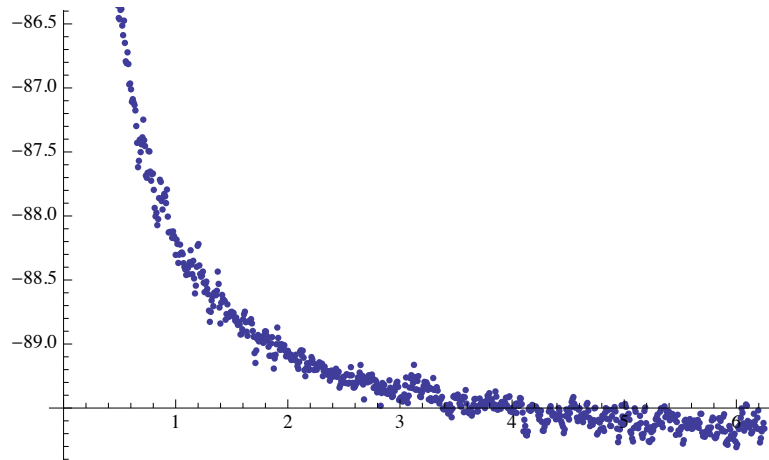


It appears that the decline does not happen at 0.1 Hz, which is likely due to something occurring within the spectrum analyzer being used to measure these data points.

## Frequency versus Phase:

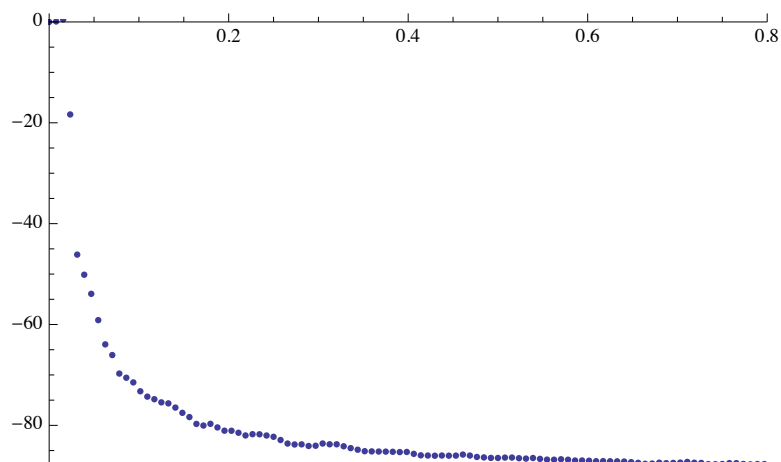
- Let the x axis be the frequency (Hz)
- Let the y axis be the corresponding phase

```
ListPlot[FrequencyPhase]
```



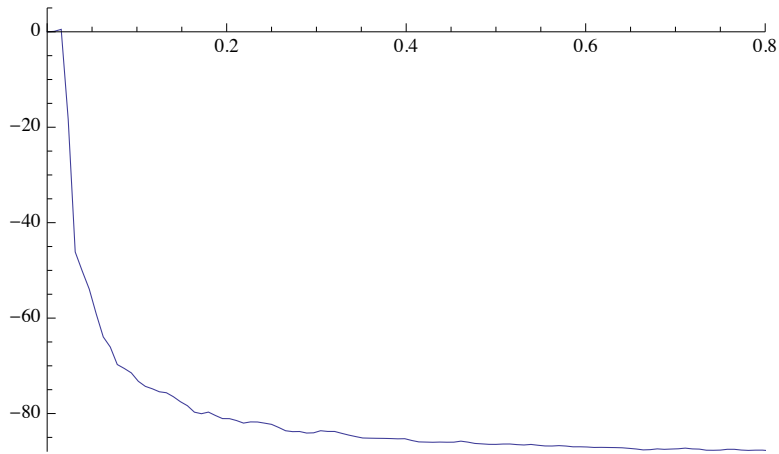
Zoom in to area of interest : ~0.1 Hz

```
ListPlot[FrequencyPhase, PlotRange -> {{0, 0.8}, {-88, 0}}]
```



Connect data points with a smooth line.

```
ListPlot[FrequencyPhase, PlotRange -> {{0, 0.8}, {-88, 5}}, PlotJoined -> True]
```



This graph confirms that the cutoff frequency desired (~0.1 Hz) is not being achieved. This means that the configuration must be altered to compensate for whatever extra stuff is happening within the spectrum analyzer.