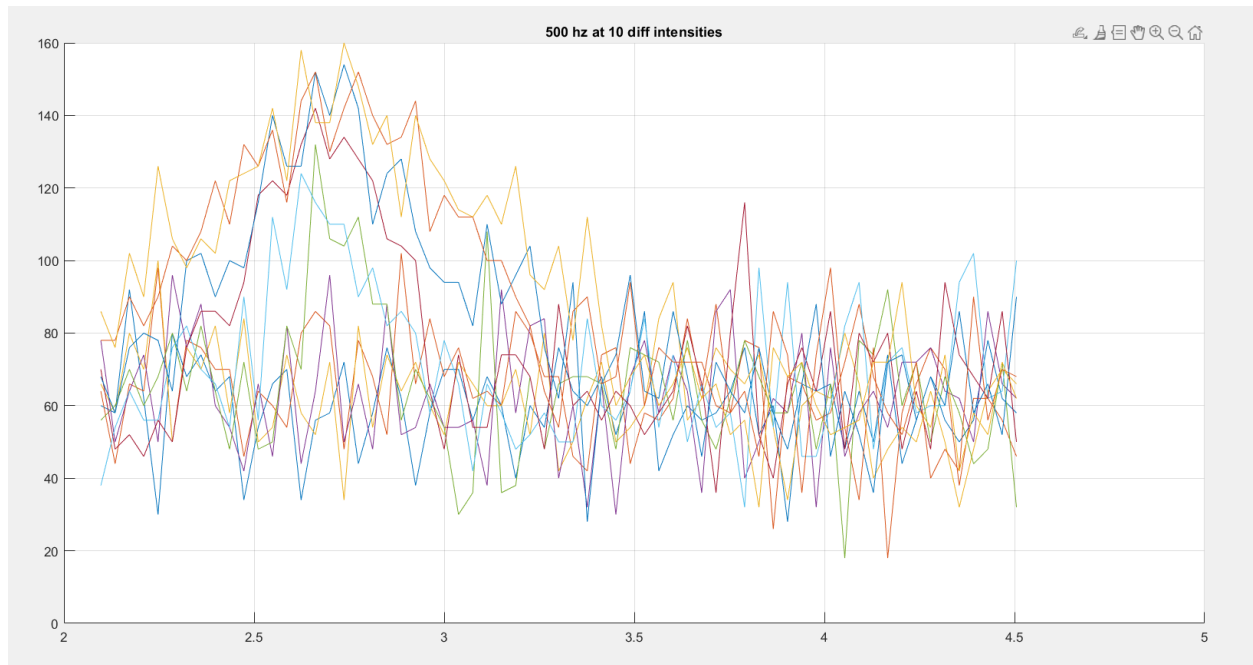
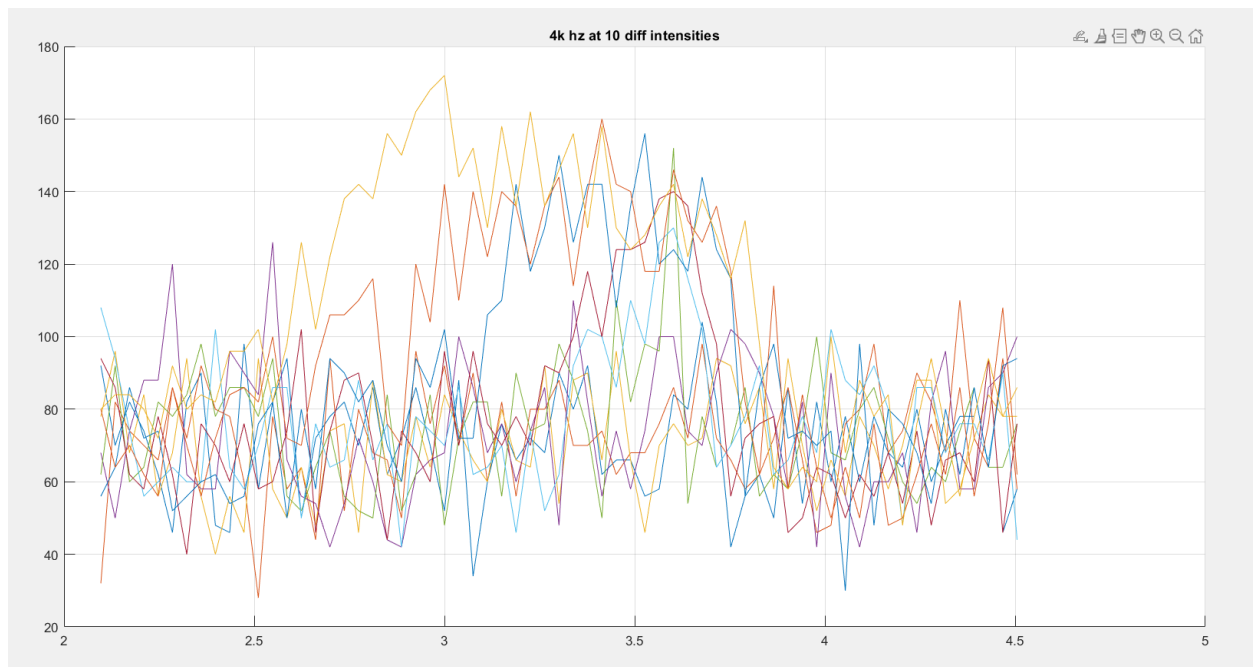


### Question-1

Rate vs log(frequencies) for different intensities for ANF of BF 500 Hz

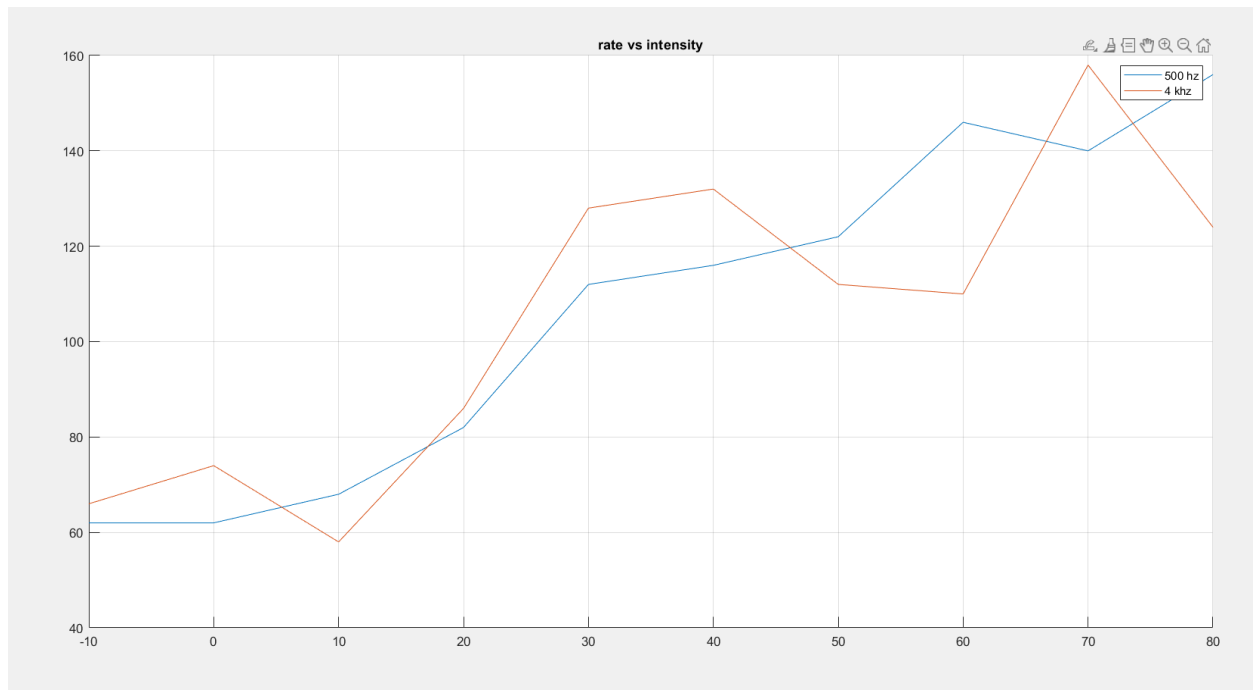


Rate vs log(frequencies) for different intensities for ANF of BF 4 kHz



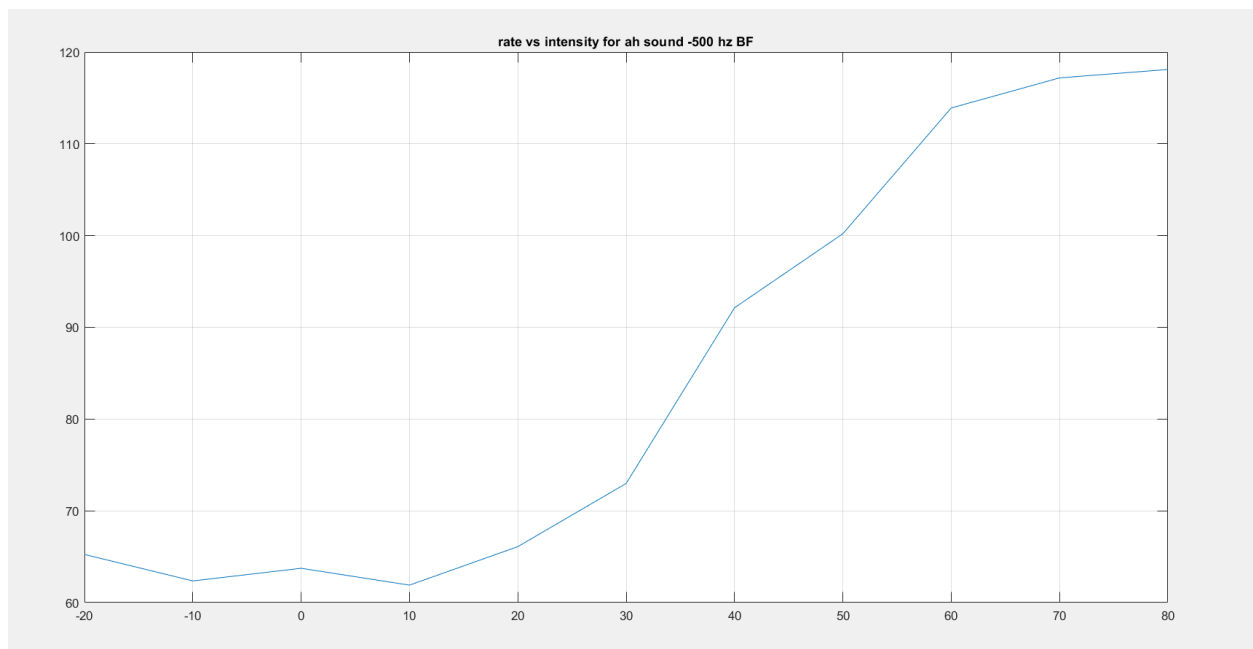
Observation: In the first figure, there is a peak around 2.6, which is  $\log(500)$ . Hence indicating that the fiber has a best frequency of 500 Hz. In the second figure, the peak is around 3.6, which is  $\log(4000)$ . Hence indicating the fiber has a best frequency of 4 kHz.

## Rate vs intensities



Observation:- For fiber of BF 500Hz, there is a spontaneous activity range. Later, as intensity increases, rate also increases. Later, we expect a saturation, which is not visible in the plotted range of intensities. For fiber of BF 4 kHz, we see a rise and fall pattern. It seems that saturation range and spontaneous range are in range outside of the frequency range plotted.

## Question-2



Observation:- As expected, the rate vs intensity plot has 3 ranges

1. Spontaneous activity:- Nearly same rate at low intensity
2. Dynamic range: With intensity increasing, rate also increases
3. Saturation Range: The rate is now stable with increase in frequency.

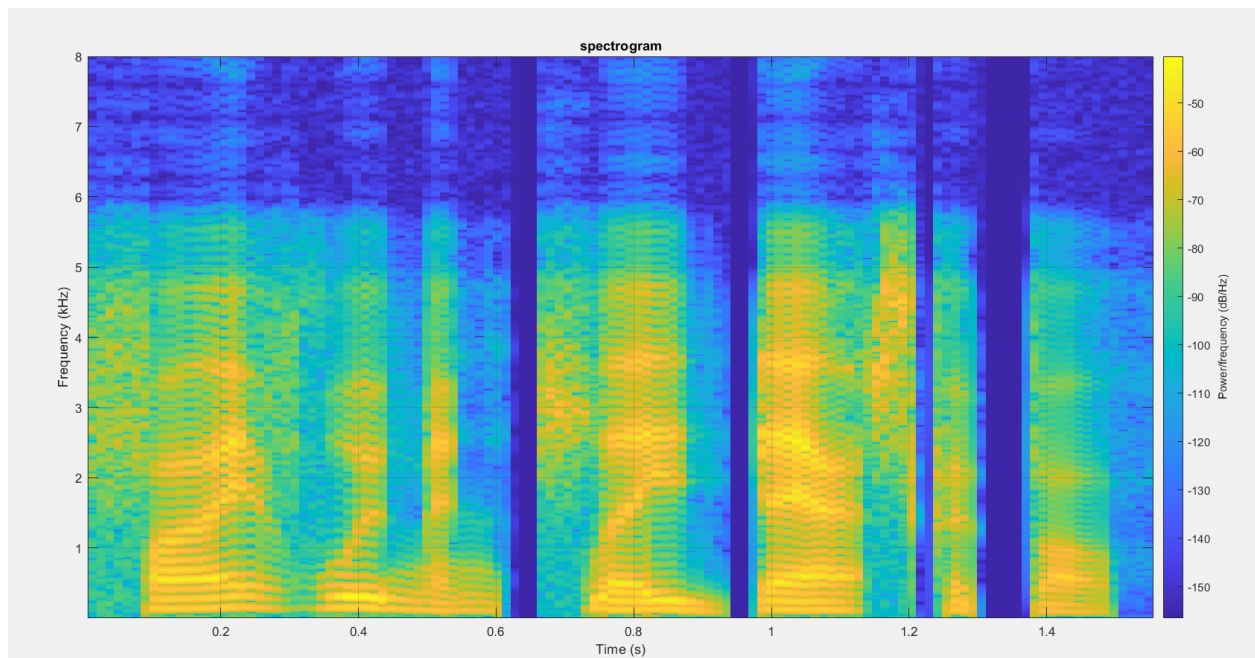
Choosing an intensity from each range:-

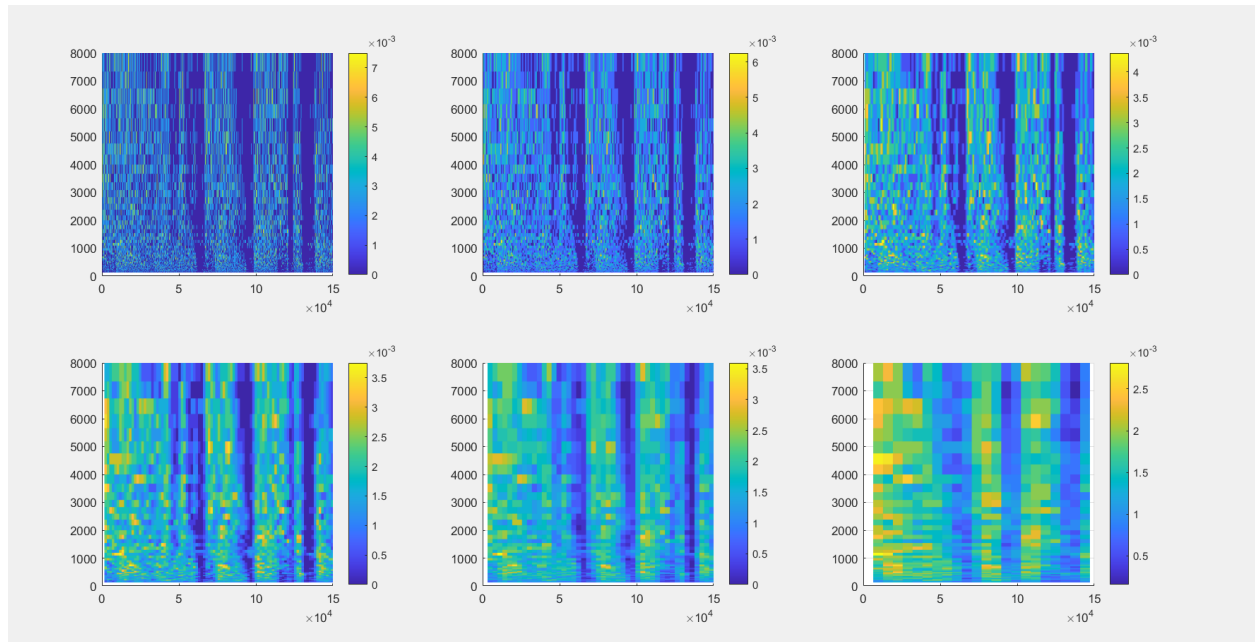
Spontaneous activity range dB = 0

Increasing range dB = 40

Saturation range dB = 76

76 is chosen because it is closer to the RMS value of aah sound.





The “akin to spectrogram” was plotted at intensity 76 dB SPL.

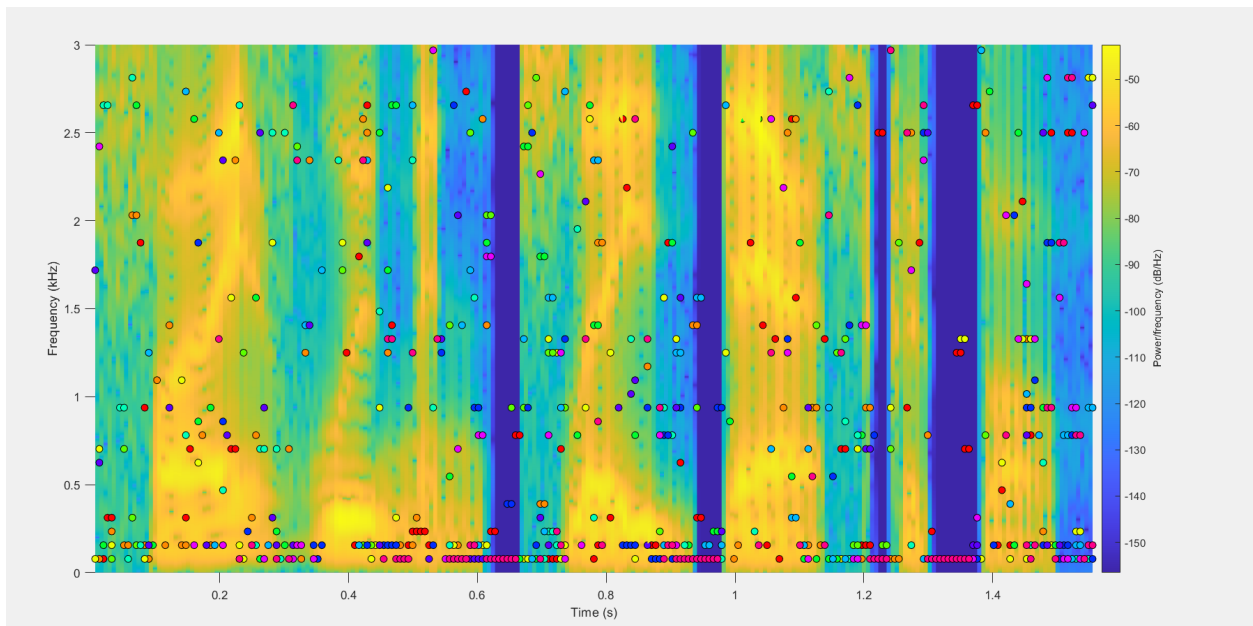
Response rates- color wise, X axis - time, Y axis - frequencies.

Window sizes, 4,8,16,32,64,128 ms

As window size increases, the similarity between Response Rates and Spectrogram increases.

The larger the window size, the more the spectral information in sound seems to be preserved.

### Question-3



Observation:- All the points of maximum FFT for a certain fiber are located around its best frequency, that too in the high energy region of the spectrogram.