MAE 298 – Homework 1
Computation of Sound Pressure Level and Octave Band Spectrum

Logan Halstrom
PhD Graduate Student Researcher
Center for Human/Robot/Vehicle Integration and Performance
Department of Mechanical and Aerospace Engineering
University of California, Davis
Email: ldhalstrom@ucdavis.edu

1 Introduction

Give overview of homework and background concepts

2 Read Data

list functions used to read data, how python/matlab compare.

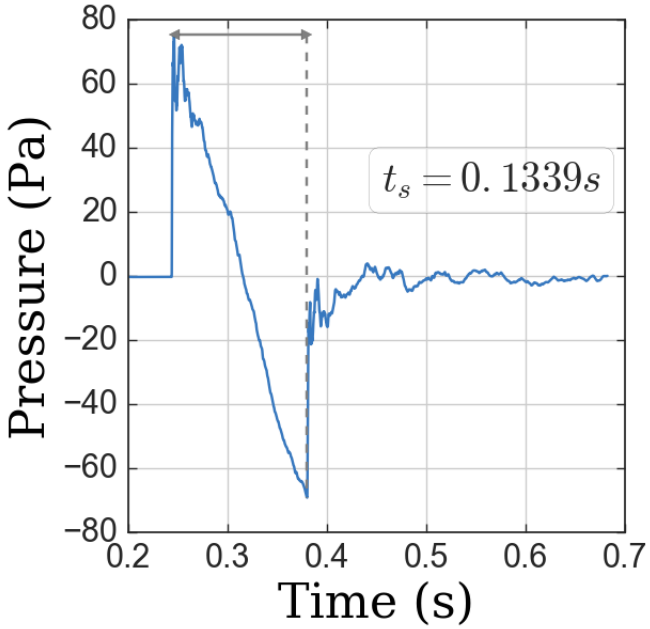

Fig. 1: Recorded sonic boom shockwave pressure time history in characteristic high-low pressure N-wave shape (Zero-pressure from recording start to initial shock)

3 Frequency Domain

decompose into frequency domain with FFT

3.1 Power Spectral Density Decomposition

power spectrum density decomposition stuff

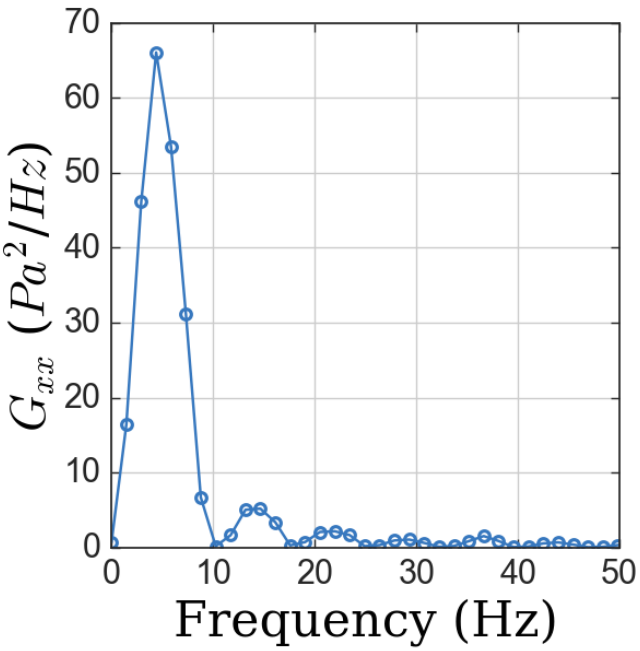

Fig. 2: Shockwave signal power spectral density as a function of frequency (All frequencies above 50Hz very low power)

3.2 Sound Pressure Level

this is actually in the plot in the next section

4 Octave-Band Spectra

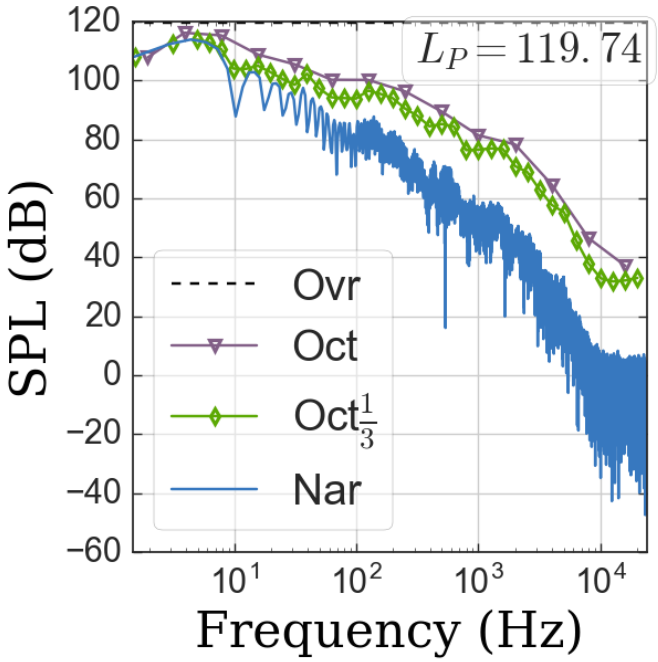

Fig. 3: Shockwave signal narrow-band, $\frac{1}{3}$ octave-band, and octave-band, with overall Sound Pressure Level reported in upper right

5 Conclusion

conclude