# Acoustic Radiation modelling

*Tools & Skills: Python, SSH, Data Analysis & Visualization*

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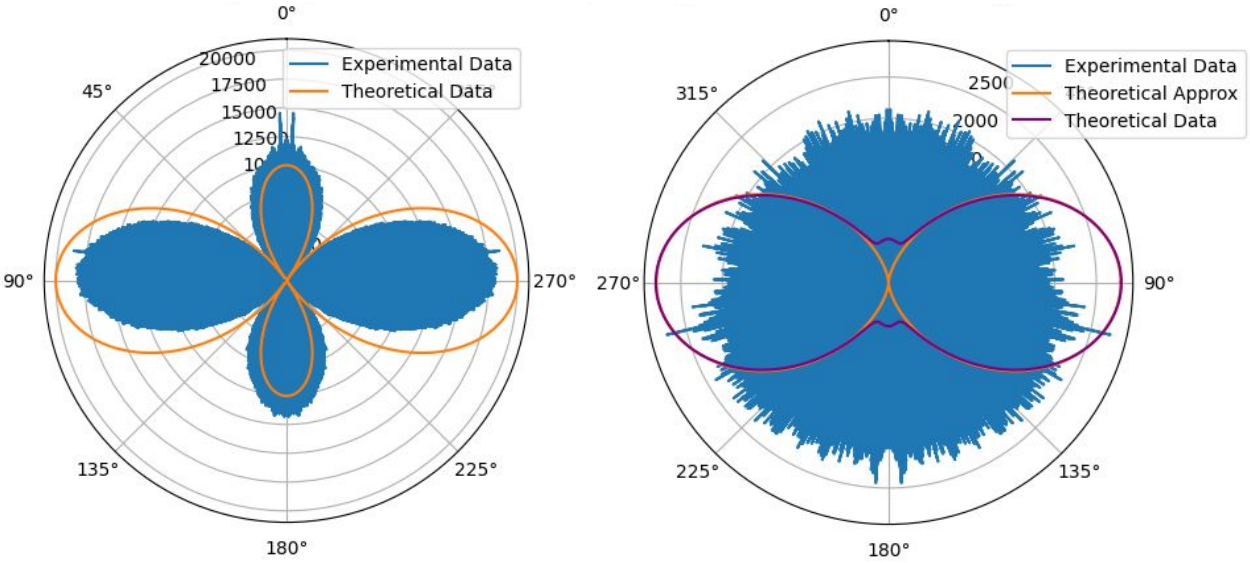



*Radial plots of relative sound intensity vs tuning fork angle. Near field left, far field right. Blue - data, Orange - linear dipole, Maroon - linear dipole approximation.*

**Links:** Theory (Russell, 2000), Lab Notebook, Tech Presentation

## Goal:

To model the intensity pattern of sound radiated from a tuning fork as a function of distance and angle.

## Outcome:

Modelled the sound intensity pattern as a linear dipole in the near field. Results for the far-field did not match theory.

## Key Features:

**Experiment setup:**

- A tuning fork with symmetric magnets fastened to the prongs to be driven at a specified frequency by a DC motor
- A stepper motor at the base to control the angle of rotation of the tuning fork and an adjustable microphone to record sound at a specified distance

**Process:**

- Record the tuning fork being struck lightly and analyse the frequency domain of the recorded sound
- Drive the motor (and thus the fork) at the fundamental frequency while simultaneously rotating the tuning fork
- Record from the adjustable mic at different distances and plot against linear dipole (theory from paper).

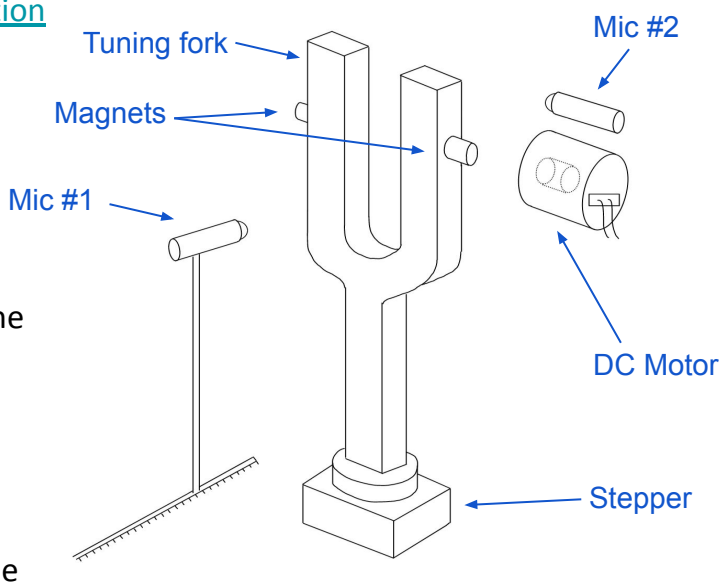
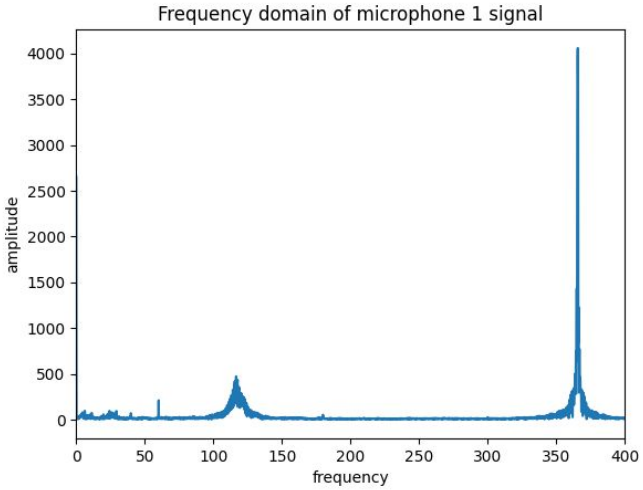



*Diagram of experiment setup.*




*Finding the resonant frequency of the tuning fork.*