

Update Report

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1 Current Research Direction

Thesis revision is currently in progress. The “Chapter 3: Theoretical Framework and Methods” section is nearly complete. It is missing the complete derivation for the wave equation at the start of the “Analytical Solution to Sound Propagation in ducted flows” but has the governing equations, the nonuniformities in swirling mean flow, the linearization and the non dimensionalization that will be used.

2 Research Performed

The current Methods section is included. The initial results for the MMS study is also included. The goal is finalize what I can now and include my initial findings for the uniform flow case that contained the boundary problems.

3 Issues and Concerns

Formatting is happening in parallel. There are missing labels and equation numbers and some equations are not being referenced when mentioned, leading to confusion for the reader

4 Planned Research

- Include the derivation for the wave equation that is used for validation work. I would like to start the “Analytical Solution to Sound Propagation in ducted flows” section with this and emphasize that the equations outlined above this section present the eigenvalue problem, but the problem can also be solved by solving a second order ODE for pressure, but this has pros and cons that need to also be discussed.
- The MMS theoretical background needs to also be included in its own section prior the numerical methods section