Daily Research Report

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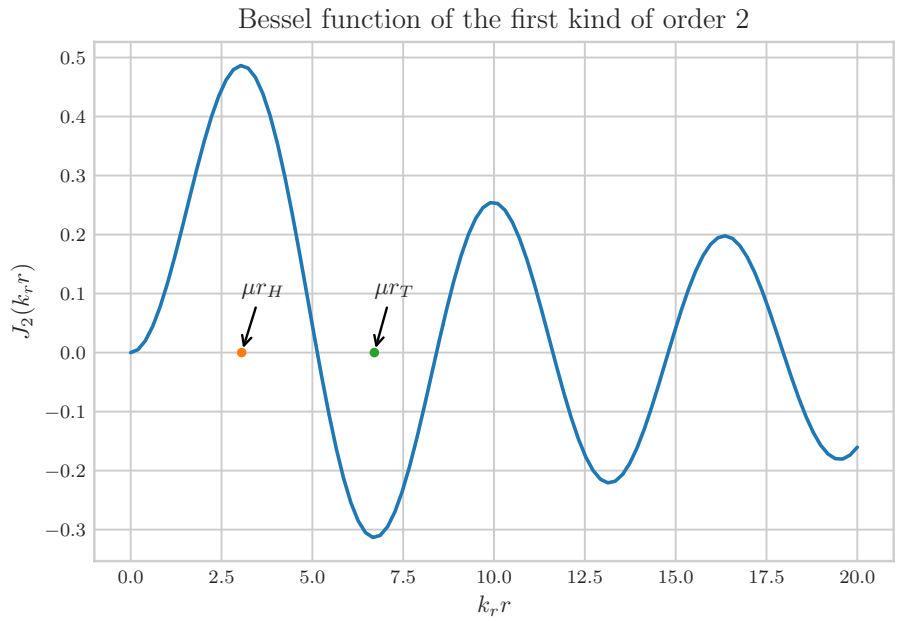


Figure 1: Bessel Function of the First Kind with the zero crossings of its derivative identified

1 Current Research Direction

The goal is to complete the validation for SWIRL by creating a range of test cases.

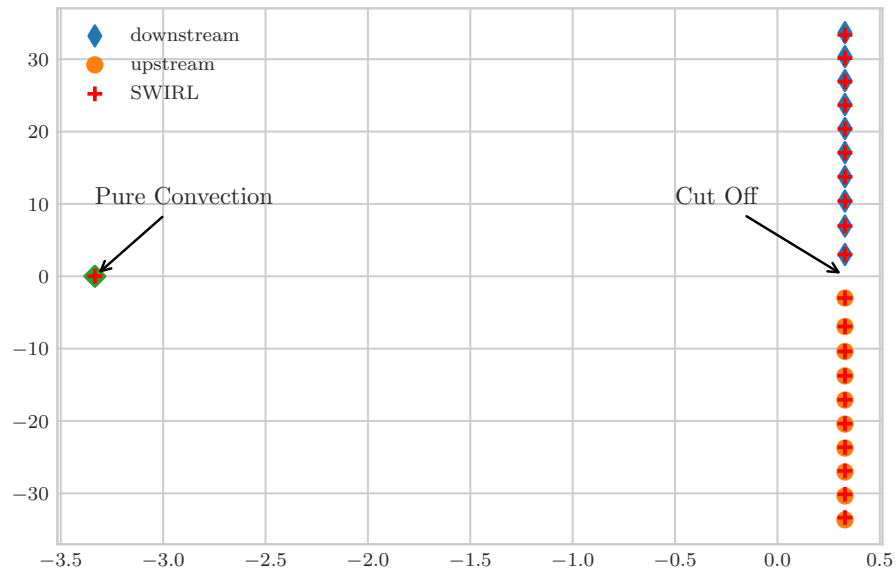
2 Research Performed

The axial wavenumbers for a uniform flow case where $m = 2$, $M = 0.3$ and $k = -1$ is presented.

The acoustic modes are along the cut off line (parallel to the imaginary axis) and the convective modes are to the left or right of the line. There were mistakes in the AnalyticalDuctMode documentation and those were corrected

3 Issues and concerns

There was a realization (from yesturdays report) that the analytical solution for an annular duct is different that for a cylindrical duct. That means that the expression provided may not be correct for the test cases in Kousen's work. I believe Amr's expression should be used instead.



4 Planned Research

Try a different expression for an annular duct and see if there is better agreement.