Daily Research Report

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1 Current Research Direction

I have been writing my own version of a results section that is checking Kousens work. I am starting with the analytical solution and I have confirmed that my notes confirm Kousens equation 4.1. by checking Kerrebrocks "Aircraft Engines and Gas Turbines, 2nd Edition" Chapter 9, section 9.3 which was very succinct and included a nice sanity check.

2 Research Performed

- Drafted analytical solution documentation started reviewing the draft.
- Started coding up the analytical solution shown in Kerrebrock's book. Kousen cited Shakar's references. The analytical solution should provide a way to check the eigenvalues and vectors.

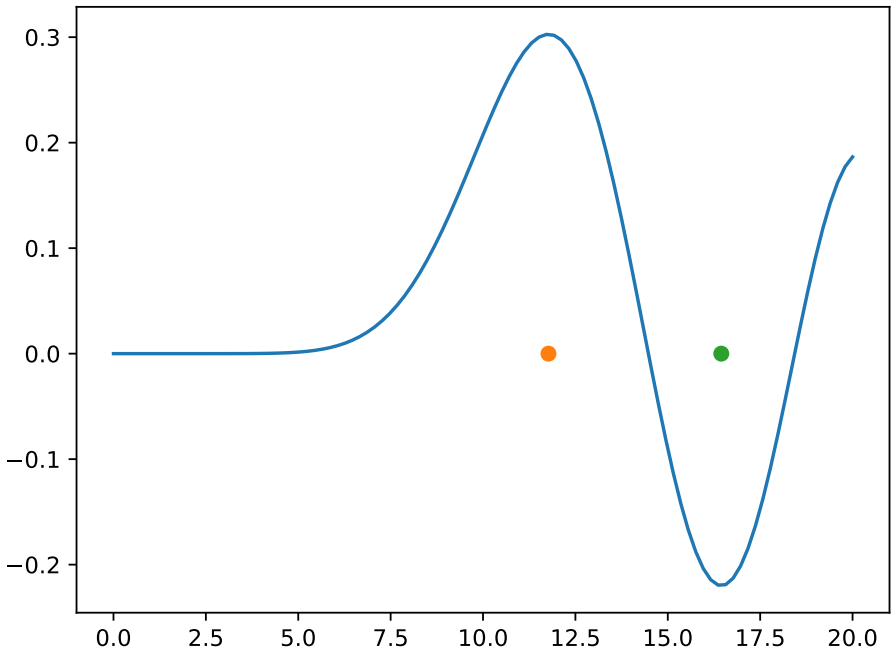

Figure 1: Bessel Mode shown in kerrebrock and the derivative zeros needed for solution

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3 Issues and concerns

I have two ways of obtaining the zero crossings for the analytical solution. The simplest way is to use Python's Scipy library, however, the infrastructure for using the intrinsics in FORTRAN has been coded and Python and can be used as psudocode for a faster FORTRAN 90 code.

4 Planned Research

Include sanity checks in the AnalyticalDuctModes.pdf that show the level of detail as shown in Kerrebrock.