Assignment 3 - Fast Fourier Transformation

OE4080

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Fast Fourier Function

The Fast Fourier Function is an algorithm which converts a time function into a frequency dependent function. In other words, this Fourier Analysis converts a signal from its original domain (often time or space) to a representation in the frequency domain and vice versa.

Fast Fourier transforms are widely used for applications in engineering, music, science, and mathematics. Here, the algorithm is being used to find the spectrum of the force encountered on a vertical cylinder.

Assumptions:

- The forces encountered by the cylinder are Froude Krylov forces

- Cylinder starts at origin

- Force is calculated from the start of the cylinder at $t = 0$ with deep water condition

- Phase does not drastically change w.r.t. time, so η is taken as $\frac{H}{2}$.

- Wave height and the depth of the deep sea is also assume as known entities.

Matlab code used for generating the environmental variables $\longrightarrow$ (github)

GitHub link to all the assignments for OE4080 course here