Implementation and Verification of Wesssingler Lifting Line Method in Institute Rotorcraft Dynamics Code

Background: The current rotorcraft dynamics code employed at the Institute for Rotorcraft and Vertical Flight is based on a classical Blade Element Method (BEM) for aerodynamic modeling. While BEM is computationally efficient, it falls short in capturing certain unsteady and three-dimensional effects inherent to rotor blade aerodynamics. A more physically accurate approach—**Wessingler Lifting Line Method (Wessingler-L)**—offers higher-fidelity modeling by incorporating spanwise circulation and induced velocity distributions. This project aims to implement and validate the Wessingler-L method as an enhancement to the existing simulation framework.

Goal: To implement the Wessingler-L lifting line aerodynamic model into the existing rotorcraft dynamics code and to verify its accuracy and performance against established benchmarks and/or high-fidelity CFD data.

Skills:

Solid foundation in aerodynamics

Numerical methods and algorithm development

Experience in C++ programming language (or willingness to learn)

Language: English
Start: As soon as possible
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