Institute for Rotorcraft & Vertical Flight

Dynamic Propeller Group
(Simulation/Programming/Experimental)

Keywords: **Propellers, Rotors, Structural Dynamics, Aerodynamics, Aeroacoustics, Flight physics, Aeromechanics, VTOL, UAV**

Background:

At the Institute for Rotorcraft & Vertical Flight, a new research group has been established, focusing on the dynamic behavior of propeller systems. The dynamic effects, well-known from classical helicopter systems, become increasingly significant as the size of propeller systems in the UAV/UAM market grows. Unlike traditional rotors, propellers typically lack flapping and lead-lag hinges, resulting in disproportionately large loads during forward flight for larger propellers. To manage these loads and vibrations, propellers must be designed with aeroelastic properties similar to rotor blades. The Dynamic Propeller Group is dedicated to achieve this goal and seeks support from motivated students to contribute to their innovative research efforts.

We offer: We offer interesting topics around the aeroelastic Propeller Design.

- Implementing and testing Leading Edge Protection Options for Rotor- & Propellerblades (Experimental)
- Including aeroelastic beam theory in the institutes Aeromechanic Code (Programming&Simulation)
- Automatized Aerodynamic & Aeroacoustic Propeller Optimization for Efficiency (Simulation&Programming)
- Aeroelastic Sensitivity Studies for Propellers using Multiphysic Codes (Simulation)
- Support in the production of our propeller blades (Hiwi)
- And more ....

About us: We are a Team of PhD students looking for support from motivated Students (BA&MA). We work with our state-of-the-art research software and the institutes Rotor test rig. You are looking for interesting topics and want to work in the field of UAV/VTOL together with other Students sharing your interests? Feel free to contact us and send us a short motivational letter! We are looking forward to hear from you!

Skills: High motivation and the ability to independently familiarize with new topics.

Tools: Nastran(FEM)/Hypermesh/Python
Language: English/German
Start: now or later
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