Chair of Aerodynamics and Fluid Mechanics
TUM School of Engineering and Design
Technical University of Munich

Analysis of Wind Tunnel Data of an eVTOL Model

Semester Thesis / Forschungspraxis / IDP

Description:

With the increasing demand for efficient transportation in metropolitan areas, much effort is being devoted to the development of innovative aircraft to meet urban needs in what is known as Urban Air Mobility (UAM). To this end, several innovative aircraft configurations have been proposed, with emphasis on electric vertical take-off and landing vehicles (eVTOL). These concepts incorporate elements that in the past were present in traditional fixed-wing aircraft and helicopters, presenting new aerodynamic challenges.

At the Chair of Aerodynamics and Fluid Mechanics, wind tunnel experiments will be carried out to investigate the aerodynamics of such novel designs. For this purpose, a scaled wing model with tilting propellers is currently in development.

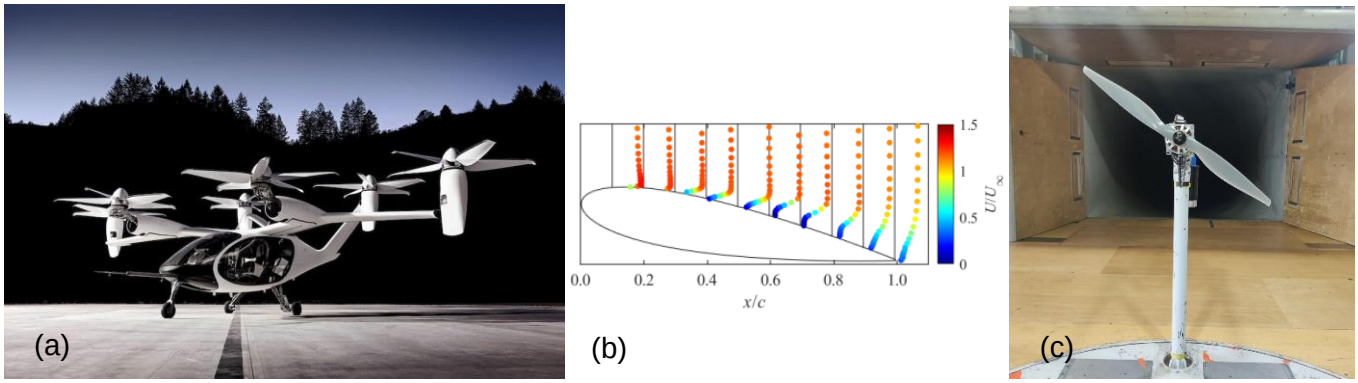

Figure 1: (a) example concept of eVTOL aircraft (Source: Joby Aviation); (b) Flow speed distribution over wing section (Source: Ikami et. al., 2022), (c) Wind tunnel A at the Chair of Aerodynamics and Fluid Mechanics.

In this thesis, results from wind tunnel experiments are to be analyzed in depth and represented graphically using MATLAB. Furthermore, there is the possibility of carrying out assistance tasks with the wind tunnel experiments at the facilities on campus.

Requirements:

- Self-organized and independent worker
- Good communication skills
- Strong programming skills, preferably with MATLAB
- Time flexibility to adapt to wind tunnel experiment scheduling
- Basic knowledge of aerodynamics preferable

Possible start: Immediately

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