Master Thesis - “Nacelle design for an electric fan” (30 credits/20 weeks – 1 or 2 students)

Project Background

GKN Aerospace is exploring green alternatives to today’s fossil fuel dependent aircraft engines. One such alternative is using an electric motor to drive a propeller or fan using batteries or fuel cells as the power source. Electric propulsion has potential to be a good candidate for shorter flight routes, such as regional flights.

The choice of engine for an electric aircraft – propeller or fan – is not clear. During the engine selection process for a potential aircraft manufacturer, a large number of aspects must be considered, e.g. efficiency, safety, noise and complexity. A very important aspect of the fan is the nacelle, which directs the flow in and out of the fan, shields the environment from noise and is a large contributor to safety.

Assignment Description

The work will mainly focus on aerodynamic design and analysis of a nacelle suitable for an electric fan. GKN Aerospace Sweden is leading the Electric Fan Thruster project, co-funded by the Swedish Energy Agency, which focus on electric propulsion. The EleFanT project will supply this master thesis project with a relevant baseline geometry of the nacelle, as well as specifications of relevant flight conditions for the aircraft which these engines would be mounted on. An academic background and an interest in aerodynamics and optimization will be important assets for the student(s) who undertake this work.

The intended outline of the project is to first design an axisymmetric nacelle suitable for an operating condition representative of cruise conditions. This work would be followed by designing an axisymmetric nacelle that works well in cruise conditions as well as for a low angle of attack scenario. The final exercise is the design of a non-axisymmetric nacelle that performs well in cruise and for a high angle of attack condition.

Qualifications

One or two student(s) in the final year of their M.Sc. studies in the field Mechanical or Aerospace engineering.

Ideally, the applicant(s) has studied optimization, fluid mechanics, aerodynamics and aircraft propulsion. Most important, however, is an interest in aviation and in learning!

Apply by

Send your resume and cover letter to Marcus Lejon, marcus.lejon@gknaerospace.com, +46 520 29 32 87Last date for application: 2021-12-31. Interviews will be held continuously and the position could be filled prior to the last application date.