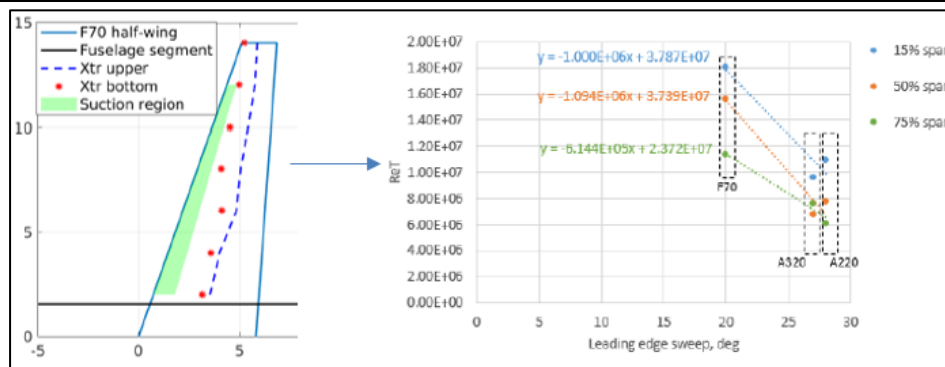


Master thesis / Student Project

Topic	Assessment of active flow control at early design stage
Subject focus	Aerodynamics, Multidisciplinary Design Optimization, Conceptual Aircraft Design
Contact	Msc. Valerio Mosca, IFL Raum 033 v.mosca@tu-braunschweig.de, Tel. 0531 / 391 9927
Requirements	<ul style="list-style-type: none"> • Solid programming skills: MATLAB • Good understanding of aerodynamics • Understanding of multidisciplinary design optimization concepts • Fluency in written and speaking English



Boundary layer transition and its approximate formulation

Introduction

The need for sustainable and energy-efficient air transport pushes the aviation industries toward the design of next-generation aircraft, with dramatic energy consumption, emission, and noise. The Cluster of Excellence SE²A – Sustainable and Energy Efficient Aviation is an interdisciplinary research centre investigating technologies for sustainable and energy-efficient air transport systems. One of the important streams of technology assessments is related to the investigation boundary layer suction in order to minimize drag.

The present project is focused on wing optimizations considering hybrid laminar flow control of existing or new designed aircraft of different classes in order to establish different correlation to be used at early design phase. The goal is to understand how to assess the effect of active flow control in the evaluation of drag when only low-fidelity and mission analysis tools are used.

Task Description

- Establishing an aircraft database considering active flow control technologies;
- Running different wing optimization test cases using active flow control and post-processing of the results;
- Develop correlations to be applied at early design phase.

Start date: Immediate