Flight trajectory optimization for low climate impact

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Project Overview

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Conventionally, small aircraft is used for regional flights to keep the operating cost low. As the demanding in air transportation increases dramatically over the past decades, it is becoming increasingly challenging for the air traffic control. To reduce the air traffic load, one solution could be using large aircraft over short range during busy seasons. The question then remains how the direct operating cost and the climate impact of aviation varies accordingly.

The aim of this MSC thesis is to optimize the flight trajectory for different aircraft category with respect to direct operating cost and climate impact for given missions. Based on the optimization results, analysis should be performed to evaluate the main gain both in cost and climate perspectives.

Project Goals

The work envisaged within this MSc thesis are as follows:

Supervisor

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- Literature study on the climate impact by aviation and flight trajectory optimization
- Familiarize with EMAC/AirTraf model (written in Fortran) and AirClim simulation tool
- Categorize aircraft models to be used for simulation
- Perform trajectory optimization considering trade-off between operating cost and climate impact.
- Analyse the climate impact attributed to various parameters e.g. aircraft fleet, performance... for given mission.
- Draw relevant conclusions



MSc Research Thesis Assignment