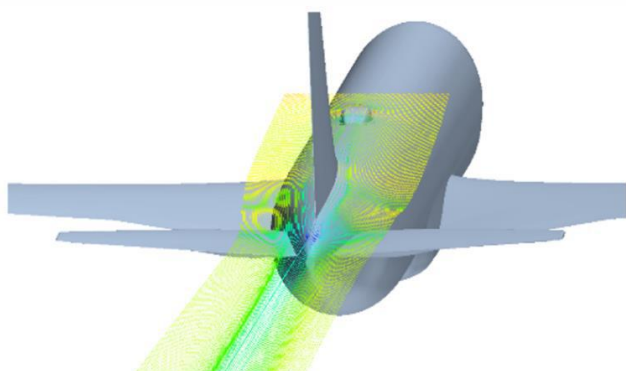


Aerodynamic validation of a radome for Ka-Ku antenna

Objective

Broadband internet in airliners is a major challenge for airline companies. To do this, it is necessary to install a large antenna (> 1 meter) usually on the top of the aircraft fuselage. The addition of such a device requires aeronautical certification (EASA, FAA) to ensure that aircraft performance is not hampered. It is in this context that we step in to carry out the aerodynamic validation of this aircraft modification.



Result

These virtual tests made it possible to diligently assess the aerodynamic performance after modification of the aircraft.

We also digitally analyzed ice formation and vibration risks. As a result, the client successfully obtained EASA certification for their system and we enabled them save substantial savings on their flight test budget.

Implementation

Zelin has set up a calculation process that's dedicated for the 3D modeling of this type of flow:

- Use of an Aircraft Aerodynamics Expert profile
- Material resources: HPC cluster (200 cores) & SIEMENS StarCCM+ Software
- Some analytical examples:
 - o Advanced mesh sensitivity (up to 60 million cells).
 - o Results refinement by dual approaches: steady (RANS) & unsteady (URANS).
 - o Visualization of the coherent wake structures by Q criterion iso-surfaces
 - o Modelling the icing phenomenon
 - o Vibration assessment

