Invitation à la soutenance publique de thèse

Pour l'obtention du grade de Docteur en Sciences de l'Ingénieur

Monsieur Sébastien LUGAN
Master ingénieur

Geometry-based simulations for detection of wake vortices using a pulsed Doppler lidar

Lidar (laser radar) sensors aimed at detecting aircraft wake vortices have been studied and improved for decades. Most techniques rely on Doppler sensors located on the airfield, beside the runways (orthogonal to the axis of the wake vortices). More recently, on-board lidar detection of wake turbulence was investigated, positioning the Doppler sensor along the axis of the wake vortices. This axial approach is technically challenging because of the weakness of the Doppler return received axially, low signal-to-noise ratios due to the sensor technology used, the scarcity of the measurement points and the lack of a priori characterization of the wake vortices detection patterns.

In the frame of large European consortia, we looked for solutions to increase the quality of the detection, not only considering the post-processing unit but also the global design of the Doppler sensor, identifying the best system parameters such as scanning pattern, beam diameter, pulse length, range, etc.

This thesis results from this research and presents a new approach relying on direct geometric simulations (assuming a perfect projected velocity sensor) associated with approximate noise models corresponding to specific sensor technologies to perform fast evaluations of detection scenarios, image processing based wake vortices detection techniques and finally direct applications to various realistic detection scenarios.

Membres du jury :
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Mr. Frédéric Barbaresco (Thales Air Systems, France)

Lundi 26 septembre 2016 à 16h00
Auditoire BARB 94
Place Sainte Barbe, 1
1348 Louvain-la-Neuve