



Institut Supérieur de l'Aéronautique et de l'Espace

## RESEARCH MASTER INTERNSHIP

Département Aérodynamique, Energétique et Propulsion

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### INTERNSHIP DESCRIPTION

Domain : Aerodynamics, flow control, experimental fluid dynamics.

Title : **DEVELOPMENT OF FLOW CONTROL STRATEGIES FOR MODIFICATION OF THE FLOW STRUCTURE IN THE WAKE OF A SIMPLIFIED C-130 SHAPE.**

The present study is part of an international project, the Airflow Influence on Airdrop II (AIA-II) Long Term Technology Project (LTTP), involving France, Germany, US and UK NATO partners. The organizations for each country are as follows: France–ISAE, Germany–IABG and BWB, United Kingdom–JATEU (Joint Air Transport Evaluation Unit) and AWC (Air Warfare Center), United States–Natick Soldier Research, Development and Engineering Center and USAF Academy.

This project aims at development of innovative flow control strategies for the modification of the highly rotational flow structure in the close-wake of military transport aircrafts. It will consist in designing, manufacturing and experimentally validating different passive and/or active leading-edge flow control concepts, able to counter the influence of the previously identified upsweep vortices. Experiments will be performed in the ISAE/S4 large wind tunnel. They will include three components stereoscopic PIV measurements, for the characterization of the flow field in the close-to-aircraft area, and global weighing for the determination of the influence of those concepts on aerodynamic forces. Correlation between measurements and numerical results obtained by US and German partners will be achieved.

Methods: stereoscopic PIV, wind tunnel tests.

20 % Theoretical Research

80 % Applied Research

100 % Experimental Research

Possibility to go on a Ph.D.:

Yes

No

### APPLICANT PROFILE

Knowledge and required level:

Aerothermodynamics, Fluid Mechanics.

Languages/Systems :

Applications should be sent by e-mail to the supervisor.