INSTITUT FÜR AKUSTIK

SE²A

Modelling of a blended wing body aircraft interior for assessment of cabin noise

Project Description

Besides the CO2 footprint, noise emissions on the ground and immissions in the passenger cabin are the most serious environmental impacts of air traffic. In order to assess the overall noise impact, wave-resolving models for the numerical calculation of sound pressure distributions in the cabin are required. The cabin noise of a novel aircraft configuration, such as a blended-wing-body (BWB) design is calculated using high fidelity (wave-resolving) simulation methods (finite elements) to ensure an acceptance of new aircraft by the regulators. The noise assessment in a BWB aircraft is particularly interesting due to the design; large areas adjoining the highly integrated engines are expected to highly transmit sound compared to a pressurized tube in the conventional design with engines mounted at a distance. In order to achieve a low-noise passenger cabin design, it is important to study and investigate structure-borne sound propagation through the fuselage. Therefore, one of the main goal is to create a realistic mechanical model of the BWB aircraft for optimally predicting the sound pressure distribution in the cabin. This will include the modelling of the insulation and interior lining, along with the cabin cavity of the aircraft. An in-house finite element solver called as “elPaSo”, is used for performing vibroacoustic simulations. With the help of this investigation, an optimal modelling assumption is developed for the design of the interior cavity, which includes the passenger seats, noise damping measures etc. Further, a toolchain for model creation on the basis of prelimnary design data is developed and tested for different types of boundary loading.

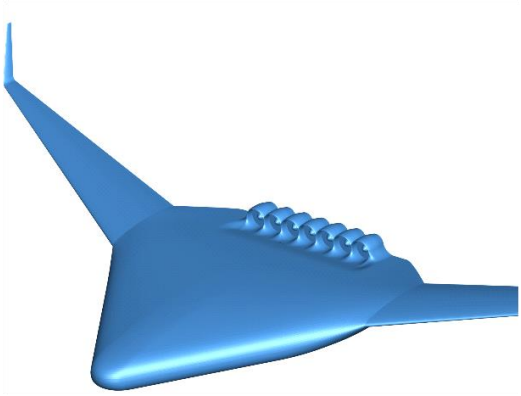

Figure 1: 3D-model of BWB aircraft

Requirements

- Good knowledge of numerical methods in acoustics, aircraft design
- Experience of programming in Python, Matlab or C++
- A candidate with an interest in the field of acoustics

The entry date is as soon as possible, and the duration of employment is limited to 6 months. The position is part-time with 50% of the regular weekly working time (currently 19,9h). Ongoing applications are possible until all positions are filled. The payment is made according to task assignment and fulfillment of personal requirements to salary group EG 13 TV-L. International applicants may have to successfully complete a visa process before hiring can take place. Candidates with handicaps will be

preferred if equally qualified. Please enclose a proof. The position is part of the SE²A International Female Programme, so only applications by female graduates of non-German universities are possible.

All documents should be in PDF format, preferably in a single file. Personal data and documents relating to the application process will be stored electronically. Please note that application costs cannot be refunded.

Contact information

Prof. Dr.-Ing Sabine C. Langer
Technische Universität Braunschweig
Institut für Akustik
Langer Kamp 19 | Raum 104
Tel.: 0531 / 391-8770
s.langer@tu-braunschweig.de
www.tu-braunschweig.de/ina