

## **Bauhaus Luftfahrt unveils „Propulsive Fuselage“ concept**

*Intelligent integration of airframe and propulsion promises significant efficiency gains*

**Berlin, 20 May 2014** – At this year’s international Berlin Air Show (ILA) starting today, Bauhaus Luftfahrt for the first time presents the concept study of a so-called “Propulsive Fuselage”. With the exhibition of a 1:30 scale model at the booth of its industrial partner MTU Aero Engines (hall 2, booth no. 2301), the interdisciplinary research organisation shows how dispensing with the classical separation of airframe and propulsion systems could open up new synergies and facilitate significant efficiency gains for future aircraft generations.

The centrepiece of the concept is a special engine design which is fully integrated into the aircraft’s tapered rear fuselage. The latter is encircled by the so-called “Fuselage Fan” powered by a gas turbine in the tail cone. The main advantage of this “distributed” propulsion architecture is the effective ingestion of the so-called “Boundary Layer” in order to re-energise its decelerated airflow in close proximity to the fuselage and to re-accelerate its wake to free-stream velocity. In doing so, the “Fuselage Fan” compensates for a significant percentage of the fuselage’s viscous drag.

Due to the reduced thrust demand, propulsive efficiency may be increased, and, the concept’s two conventional engines producing the largest part of the overall thrust could be scaled down in order to reduce weight and drag. Initial studies conducted by Bauhaus Luftfahrt within the EU-funded research project “Distributed Propulsion and Ultra-high bypass Rotor Study at Aircraft Level” (abbr.: DisPURSAL) already indicated that, despite the additional engine, the “Propulsive Fuselage” concept could, through cascade effects, enable fuel savings of up to ten percent over and above projected technology improvements targeting the year 2035.

“Research on so-called ‘distributed’ propulsion architectures and especially on the ‘Propulsive Fuselage’ has been a focus area of Bauhaus Luftfahrt’s work for several years,” explains Professor Dr Mirko Hornung, Executive Director Research and Technology. “All the more, I am happy that together with our partners in the DisPURSAL project we could successfully demonstrate the technology’s promising future potential. Moreover, I am sure that the increasing electrification of aircraft will open up even greater potential for a smart integration of airframe and propulsion in the coming decades.”

The DisPURSAL project was launched in February 2013 and is funded by the European Commission in line with its 7<sup>th</sup> Research Framework Programme. Besides the project coordinator Bauhaus Luftfahrt, the international project consortium and its industrial advisory board consist of notable companies and institutions, such as MTU Aero Engines, Airbus Group including Airbus Group Innovations, the French Office National d’Études et de Recherches Aérospatiales (ONERA), the Russian Central Institute for Aviation Motors (CIAM) and the German Aerospace Center (DLR).

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**About Bauhaus Luftfahrt:**

Bauhaus Luftfahrt is an interdisciplinary research institution funded by the four aerospace companies Airbus Group, Industrieanlagen-Betriebsgesellschaft (IABG), Liebherr-Aerospace and MTU Aero Engines as well as grants of the Bavarian Ministry for Economic Affairs, Media, Energy and Technology. The non-profit association is an internationally-oriented think tank. The team of around 50 employees deals with the future of mobility in general and with the future of air travel in particular. The goal of the research work is to consider the complex system of aviation from different points of view. In every project, the technical, economic, social and ecological aspects are considered holistically.

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