

## AGILE WING INTEGRATION (AWI) HARW DESIGN WORKSHOP

Engineers' House, Bristol. 22-26 January 2018



A five-day Technical Workshop for the Innovate UK funded Agile Wing Integration Project was held at Engineers House in Clifton, Bristol attended by a group of 30 AWI Project Partners/Researchers/PhDs from Airbus, the University of Bristol and Cranfield University.

The group combined a suite of analysis tools to study the design of a slender, large-span passenger-type aircraft. These tools consisted of both novel analysis methods developed during the project and well established industrial design tools. They were successfully applied in combination to the aircraft model and used to predict the response of the aircraft to numerous flight manoeuvres, gusts and other aerodynamic loads, leading to a revised structural design of the aircraft. Additionally, the aircraft model was incorporated into a flight simulator to gain response feedback from a test pilot based at the Cranfield facility. This pilot feedback together with the analysis results provided a valuable insight into the handling qualities of the aircraft.

Furthermore, a less-stiff version of the aircraft was also considered. The key challenge here was in accurately treating the larger deformations of the aircraft structure during flight. The so called 'nonlinearity' this generates is a key challenge in the analysis and design of the next generation of aircraft which will likely incorporate larger wing-spans and non-metallic materials into their designs; using the developed analysis tools this nonlinearity was successfully captured and modelled in the analyses performed.

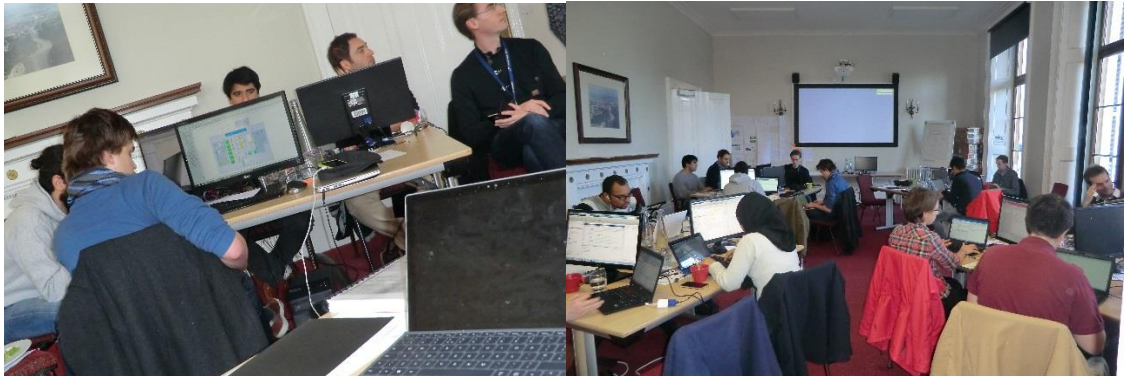
Overall, the workshop demonstrated the combined value of the research undertaken as part of the AWI project in meeting some of the technical demands of these future designs.



The following presentations were given:-

- Airbus: Ed Kay (Airbus Wing and Landing Gear Team) “FAME-W Overview and Discussion”
- University of Bristol: Chris Szczyglowski “Preliminary definition of the AWI simulation framework”

On the 3<sup>rd</sup> day of the Workshop the Project Quarterly Progress Meeting was held, attended by representatives of all Project Partners in addition to the ATI/Innovate UK Project Officer, Neil Calder.



The AWI consortium, sponsored by Innovate UK through the Aerospace Technology Institute, is led by Airbus together with Marshalls, AGI and the Universities of Bristol, Cranfield and Loughborough. The overall aims of the project are to develop rapid, world-beating, wing design and integration capabilities for use during the early phases of an aircraft product development cycle.