

Press Release

How the albatross is inspiring next generation of aircraft wings

[@Airbus](#) [#AlbatrossOne](#) [@AirbusintheUK](#)

Filton, 13 June 2019 – Airbus engineers have developed a scale-model aeroplane with the first in-flight, flapping wing-tips that could revolutionise aircraft wing-design.

The aerospace giant has drawn on nature to develop its ‘semi-aeroelastic hinge’ concept to reduce drag and overall wing weight, while combating the effects of turbulence and wind gusts.

Known as AlbatrossOne, the remote-controlled aircraft has already taken its first flights to prove the concept and the team will now conduct further testing before the demonstrator, based on the manufacturer’s A321 plane, is scaled-up further.

“While hinged wing-tips are not new – military jets employ them to allow greater storage capacity on aircraft carriers – the Airbus demonstrator is the first aircraft to trial in-flight, freely-flapping wing-tips to relieve the effects of wind gusts and turbulence,” explained Airbus engineer Tom Wilson, based in Filton, north Bristol, UK.

“We drew inspiration from nature – the albatross marine bird locks its wings at the shoulder for long-distance soaring but unlocks them when wind-gusts occur or manoeuvring is required.

“The AlbatrossOne model will explore the benefits of unlockable, freely-flapping wing-tips – accounting for a up to a third of the length of the wing – to react autonomously during in-flight turbulence and lessen the load on the wing at its base, so reducing the need for heavily reinforced wing boxes.”

Jean-Brice Dumont, Airbus’ Executive Vice-President of Engineering, said the project showed “how nature can inspire us”. He said: “When there is a wind gust or turbulence, the wing of a conventional aircraft transmits huge loads to the fuselage, so the base of the wing must be heavily strengthened, adding weight to the aircraft.

“Allowing the wing-tips to react and flex to gusts reduces the loads and allows us to make lighter and longer wings – the longer the wing, the less drag it creates up to an optimum, so there are potentially more fuel efficiencies to exploit.”

The first test flights of the AlbatrossOne demonstrator, developed by Airbus engineers in Filton, were concluded in February after a 20-month development programme. Speaking in Toulouse, Dumont said AlbatrossOne was the “first Filton aircraft since Concorde”.

It has been constructed from carbonfibre and glassfibre-reinforced polymers, as well as components from additive-layer manufacturing.

Initial testing of AlbatrossOne has examined the demonstrator’s stability with the wing-tips locked and completely unlocked, says fellow Filton engineer James Kirk.

“The next step is to conduct further tests to combine the two modes, allowing the wing-tips to unlock during flight and to examine the transition,” he added.

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The team presented their research at the International Forum on Aeroelasticity and Structural Dynamics conference in the United States this week.

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Notes for Editors

Hi-res footage of the first test flights is available here:

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