Palaiseau, June 20, 2011
Press release

Paris Air Show – Hall 2B, Stand G105

COMPETITIVENESS, SECURITY AND THE ENVIRONMENT AT THE HEART OF ONERA'S STRATEGY

Onera is announcing a series of projects and partnerships at this year's Paris Air Show, in an ongoing drive to bolster its strategic international position based on competitiveness, safety/security and the environment.

- Press conference at the International Forum for Aviation Research (IFAR) on the impact of air traffic on the environment and climate.
- Launch of a "lightning lab", to model the impact of lightning strikes on aircraft.
- Expansion of the Iroqua research program on aircraft noise reduction to include new partners.
- In a European first, the flight of an operational onboard system combining radar and optronic imaging.
- A strategic conference concerning the European study E4U (EREA for UAS), taking stock of the global state-of-the-art in drone systems, and also defining the priority technical issues that must be addressed to launch a dedicated European drone program.

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Onera, the French aerospace and defense research center, is a major participant in the Paris Air Show, taking place at the Le Bourget airport from June 20 to 26. Onera will be making a series of strategic announcements during the show, reaffirming the importance of French research in meeting the major challenges facing these sectors. Among these challenges, three key objectives reflect Onera's current focus of research: economic performance/competitiveness, safety/security, and the environment.

Onera at the 2011 Paris Air Show

1. Launch of a "lightning lab".
2. A European first: flight of an operational airborne system combining radar and optronic imaging.
3. Update on the European study E4U, designed to take stock of the global state-of-the-art in drones.
4. Press conference hosted by the International Forum on Aviation Research, at 3:00 pm on Monday, June 20 at the German pavilion (BDLI show, Hall 2, C375), concerning the impact of air traffic on the

environment and climate.
5. Signature of the agreement to extend and expand the Iroqua research program on aircraft noise reduction, on Thursday, June 23 at 10:00 am at the Onera stand (G105, Hall 2B).
6. A seminar on technology transfers between the aerospace and wind turbine industries, and on collaboration with small businesses and regulatory authorities, on Thursday, June 23 at 3:00 pm, in Room 1 of the Concorde Hall.

A laboratory dedicated to modeling the impact of lightning strikes on aircraft

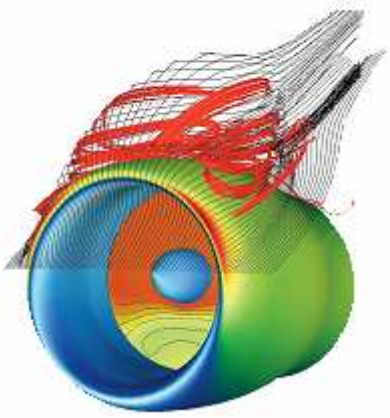
Onera has announced the launch of a dedicated "lightning lab", scheduled to start operation by the end of the year. This new research lab carries on Onera's long-standing work on modeling the impact of lightning strikes on aircraft.

Onera launches a "lightning lab".

Based on this research, Onera's scientists have been able to simulate the "chaotic" behavior of the lightning trajectory, as well as the point of attachment between the lightning and the fuselage. The new lab will considerably expand our understanding of this complex phenomena.

Noise reduction: a vital challenge for the aviation industry

Two new partners are joining the Onera-led Iroqua research program to reduce aircraft noise: the French air navigation directorate (DSNA), and the national federation of commercial aviation (FNAM). The new agreement to extend and expand this initiative will be signed during the Paris Air Show, at 10:00 am on Thursday, June 23 at Onera's stand.



Numerical simulation of the airflows in a commercial engine nacelle, showing the noise map.

With commercial airplanes having already reduced noise by 20 decibels in the last 30 years, they are beginning to reach their limits. To go even further, we have to start looking ahead to breakthrough technologies, which require considerable research. The problem also concerns noise around airports, and not just reducing the noise generated by the aircraft itself (engines and aerodynamic/airframe noise).

For further information, see the Iroqua program website: `http://www.iroqua.fr`

Click here to see the press release on the renewal of the Iroqua agreement (November 23, 2010).

Research efforts to reduce the impact of air traffic on the environment and climate

Following the second summit meeting of the International Forum for Aviation Research (IFAR), organized by Onera on June 18 and 19, 2011, a press conference will be held at the Paris Air Show on

Monday, June 20 at 3:00 pm in the German pavilion (BDLI show, Hall 2C-C375). This conference will offer an opportunity to review the major challenges facing the air transport industry, and where research efforts must be concentrated to reduce its environmental impact.

Members of the Forum will be showcasing the most promising developments, as well as their roadmap for the future.

Airborne imaging, with the Sethi flying lab

June 2011, a European first: French defense procurement agency DGA is organizing a flight at the CEV flight test center of an operational airborne system combining radar and optronic imaging.

The optronic pod (visible and infrared bands) on the Sethi flying lab.

During this flight, the pods on the Sethi flying lab will be equipped with a radar detector and a high-resolution camera, to produce high-resolution images of the ground, detect activity indices (thermal analysis) and provide a fine spectral analysis, ranging from the visible to the far infrared bands.

Sethi is a new-generation airborne system combining radar and optronic imaging capabilities. Scientists can call on this flying lab to generate the wide variety of data needed for their research.

For further information on Sethi, see:
http://www.onera.fr/demr/sethi/index.php

Onera, a pivotal role in drone research

On Monday, June 20, at the Paris Air Show, Onera is organizing a review of the current status of a European study that kicked off in February and is scheduled to be completed in October 2011: E4U (EREA for UAS). Financed by the European Defense Agency (EDA), it is being coordinated by Onera on behalf of the Association of European Research Establishments in Aeronautics. The study aims to draw a global picture of the state-of-the-art in drones, or unmanned aerial systems (UAS), in order to define the priority technical subjects needed to launch a dedicated European drone program.

Tomorrow's sky will be largely dominated by drones. Researchers at Onera are focusing on three main objectives: integration of drones in civilian airspace; greater autonomy; and designing microdrones and their associated equipment.

For both Onera and EREA, this status review at the Paris Air Show is an excellent opportunity to spotlight the role that research centers can play in the development of drones. It also allows them to present their areas of excellence, with a view to the possible launch of a European research program within the scope of the European Framework Cooperation (EFC), bringing together the European Commission, EDA and

ESA.

Onera brings to the table its multidisciplinary aerospace expertise to support cutting-edge research on drones.

Maritime surveillance: a surface wave radar for the Mediterranean

The innovative surface wave radar (SWR) developed by Onera, the fruit of 20 years of research on low-frequency radars, originally developed for defense purposes, uses the ability of these waves to propagate on the surface of oceans to provide long-range maritime surveillance.

The transmitting antenna array for the surface wave radar, comprising three bi-cone antennas.

A first-generation SWR was transferred to Thales, while a second-generation model is under development by Onera on behalf of the French Ministry of Defense. Within the scope of a test program, a demonstrator will shortly to be set up in the Mediterranean to detect small craft.

Because of their "beyond the horizon" detection capabilities, surface wave radars are particularly well suited to the surveillance of large maritime surfaces, such as exclusive economic zones (EEZ).

For further information on surface wave radars, see:

http://www.onera.fr/actualites/2010-0708-onera-ROS-radar-ondes-surface.php

Onera: technology transfers, partner to innovative small businesses, and expert in wind turbines

Onera is a key partner in the development of small technology companies, supporting them through its scientific expertise and powerful numerical simulation and experimental facilities. Via these specialized companies, Onera gains access to markets that would otherwise remain closed. In exchange, Onera bolsters the credibility of these companies with financial institutions, government agencies and industry.

Starting in 2006, Onera teamed up with Leosphere to develop the Windcube, a wind speed measurement instrument that facilitates the installation of wind farms, based on Onera's laser remote-detection technologies.

Onera continually develops its scientific expertise, resulting in a number of patents for various technical solutions. It offers small companies licenses for these technologies, and the scientific support needed to bring them to market, taking an active role in a broad range of research programs to meet this objective.

On Thursday, June 23 at 3:00 pm, in Room 1 of the Concorde Hall, Onera is organizing a seminar on technology transfers between the aerospace and wind turbine industries, and on collaboration with small businesses and regulatory authorities.

Onera is heavily involved in the wind turbine sector, in particular through two programs:

- A research program to develop a "stealthy" wind turbine blade, using integrated radar-absorbent materials. Coordinated by EADS Astrium, organized under the auspices of the French Ministry of Ecology, Energy and Sustainable Development, and financed by Ademe, the French Agency for the Environment and Energy Management, this project includes Onera and the small company Plastinov.
- A program that aims to develop an application that can simulate the disturbances created by wind turbines (Sipré) over an area covering tens of square kilometers. This application can simulate future wind farm installations, and meteorologists and property developers can hold discussions based on solid scientific facts.

Onera at a glance

Onera is responsible for 25% of all Research & Technology in France in its core markets. It has over 2,000 employees, including 1,500 scientists and engineers, at eight main facilities.

Onera is the only research organization in France to consolidate all the skills and expertise needed for aerospace. Thanks to this multidisciplinary expertise , it can address the problems faced by industry, by calling on its scientific knowledge base, or developing new competencies if needed. It is also fully capable of producing full-scale demonstrators, products and systems.

Onera deploys a fleet of world-class experimental facilities, in particular wind tunnels at its Modane-Avrieux research center in the Savoy region, and at Fauga-Mauzac in southwest France.

Onera's customers and partners include national or international program agencies (CNES, ESA, etc.), government agencies (DGA, DGAC, etc.), major manufacturers (EADS, Dassault, Safran, Snecma, Thales, etc.), and innovative small businesses, with which it has worked very closely since being founded in 1946.

Each Onera researcher carries out five times as much contract business as the national average, which means that Onera's business model is unique in France and in Europe.

As a source of innovation, expertise and a long-term vision, Onera's mission is to provide the foundations needed for future developments in the short, medium and long terms. Over the years, Onera has contributed to some of the world's most successful aerospace programs, including the Ariane 5 launcher, the Airbus jetliner and Eurocopter helicopter families, the Rafale fighter and the Falcon 7X business jet.

About Onera:

Onera is the leading aerospace and defense research organization in France. A public establishment created in 1946, it reports to the French Ministry of Defense. Onera has over 2,000 employees at eight major facilities, including 1,500 scientists, engineers and technicians, of which 220 are doctoral candidates and post-docs.
Building on its multidisciplinary expertise and a world-class fleet of test facilities, Onera works for both government and industry, spanning major corporations and small businesses. Onera deploys an innovative partnership-based approach to research, with five times more contract business per researcher than the average in France. In 2009, Onera had revenues of 210 million euros. Onera is a recognized source of innovative solutions, technical expertise and long-term design vision, paving the way for tomorrow's programs. Onera has contributed to some of today's most successful aerospace and defense programs, including the Ariane 5 launcher, Airbus jetliners, Eurocopter helicopters, the Rafale fighter and the Falcon 7X business jet.

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