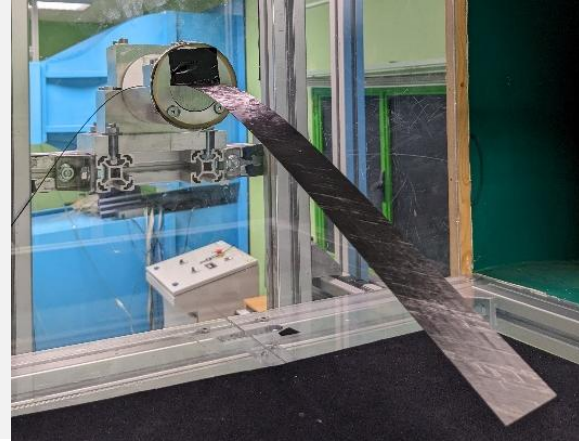


# Measuring the influence of airflow on structures using Dragonfly®

## # The Challenge

Wind tunnel measurements are regularly carried out to investigate the influence of an airflow on structures. Aeroelasticity is a field of mechanics where the interaction between the airflow and the structure is studied, **to predict and avoid instabilities**.

Wind tunnel measurements of aeroelasticity phenomena are challenging because **accurate information on the structure must be gathered without disturbing the airflow**.



# 1

### Airflow disturbances

Bulky sensors like accelerometers may dramatically **influence the results**.

# 2

### Measurement noise

Highly sensitive sensors **are required** to accurately capture the structure's movement.

# 3

### Installation time

Wind tunnel are **expensive equipment** and installation time must be **reduced to the minimum**.

## # Breaking Point

Increasing constraints on vehicle weight due to fuel consumption reasons drive engineers to manufacture more flexible structures which are more prone to flutter and other fluid-structure interaction instabilities. This increases the demand for reliable and cost-efficient wind-tunnel experiments like for example gust response measurements.

To reduce the cost of testing the instrumentation should be faster to install, without compromising on the accuracy and reliability.



We asked  
**the research center of the French  
Air and Space Force Academy**

What is the key benefit of using  
Dragonfly ?

*“Dragonfly both captures **the low  
frequency deformations and the  
high frequency vibrations  
without disturbing the airflow**”*



Annie Leroy  
Professor in aerodynamics

# 10 min

**Installation time** of Dragonfly during  
an experiment at CREA, (the research  
lab of the French Air and Space Force  
Academy)

See how **Dragonfly®** transforms the measurement  
of the influence of airflow on structures

# # The Solution

Dragonfly® is a revolutionary strain sensor delivering **1000x more resolution than a traditional strain gauge**, enabling direct, high accuracy strain and vibration measurements of structures during wind-tunnel testing.

## KEY FEATURES

### SENSITIVITY

1000X MORE SENSITIVE THAN TRADITIONAL SENSORS

### SIGNAL TO NOISE RATIO

>120dB EXTREMELY LOW NOISE LEVEL

### MEASUREMENT RANGE

±3000µm/m ABOVE STEEL PLASTICITY

### INTEGRATION

PLUG & PLAY VOLTAGE, CHARGE, IEPE STANDARD

# 1

## Zero disturbance

Thin and flexible : can be installed anywhere without disturbing the airflow.

# 2

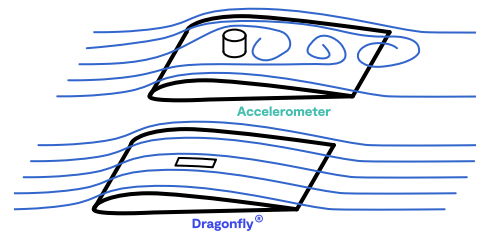
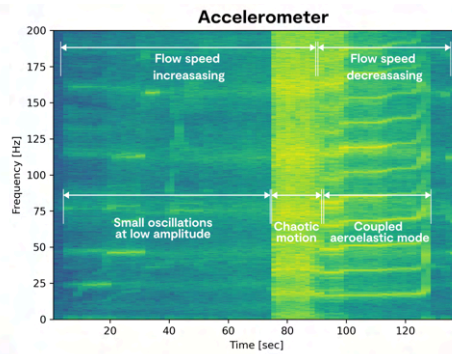
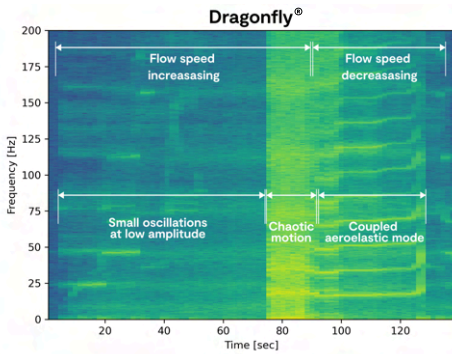
## Highest sensitivity

Dragonfly® can captures vibrations that traditional strain gauges miss.

# 3

## Plug & Play

Compact, microdot coaxial cabling and IEPE/interface reduce installation time and costs.



Dragonfly® strain sensors have a **flat form factor** (less than 200µm-thick). They can be installed anywhere on the structure without affecting the **measurement quality or disturbing the flow**.

In the spectrograms above, the wing first oscillates at low amplitude, then reaches flutter which is chaotic first, with energy distributed at all frequencies and finally oscillates in a limit cycle with numerous distinguishable harmonics. These diagrams illustrate the comparable performance of the Dragonfly® to state-of-the-art accelerometers, while avoiding the drawbacks of negative airflow impact, **leading to more accurate measurement insights**.

Dragonfly®'s versatility extends to numerous other fields.



Wind Turbines



Automotive



Infrastructures/Bridges



Transportation

and many more applications...

## Contact us



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## About us

Wormsensing is at the forefront of **advanced sensing technology**, providing high-precision solutions for aerospace, defense, and high-performance industries. With a commitment to cutting-edge precision and sustainability