

Experimental Structural Dynamics GVT — Ground Vibration Testing — Capabilities

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Goal : Structural dynamic characterization

› for analytical and numerical model updating

› for aeroelastic (flutter) analysis

› for the design of complex structures subject to dynamics loads

Excitation hardware

- › Ping test hammers
- › Modal shakers 6 N à 1000 N
- › Seismic shakers 160 N à 400 N
- › Fixed shaker table 20 kN
- › Current-driven power amplifiers



Test hardware

- › Seismic isolated platforms
- › Isolated mounting walls
- › Morane-Saulnier Paris aircraft
- › Sud-Aviation Gazelle helicopter
- › In-house test rig and model design and manufacturing capability



Measurement hardware

Accelerometers

- › Uniaxial (600+) and triaxial (20) TEDS capable sensors
- › Ultralight wind tunnel model compatible sensors

Optical sensors

- › Short range and high sensitivity optical displacement sensors
- › Keyence sensors

Laser vibrometers

- › High accuracy & high space resolution optical vibrometry
- › Polytec PSV 400 scanning laser Doppler vibrometer

Force sensors

- › Uniaxial force cells 2.2 kN rated (30+)
- › Measurement of force-current from power amplifiers

Signal acquisition and generation hardware

Siemens data acquisition system

- › Unsteady signal acquisition
- › 600+ ICP/voltage channel conditioning and acquisition
- › Control signals generation

dSpace real-time control system

- › Real-time safety control for complex experiments
- › Real-time structural identification algorithms for unsteady tests (e.g. wind tunnel flutter tests)
- › Experimental continuation of nonlinear normal modes

Analysis hardware

Of-the-shelf software

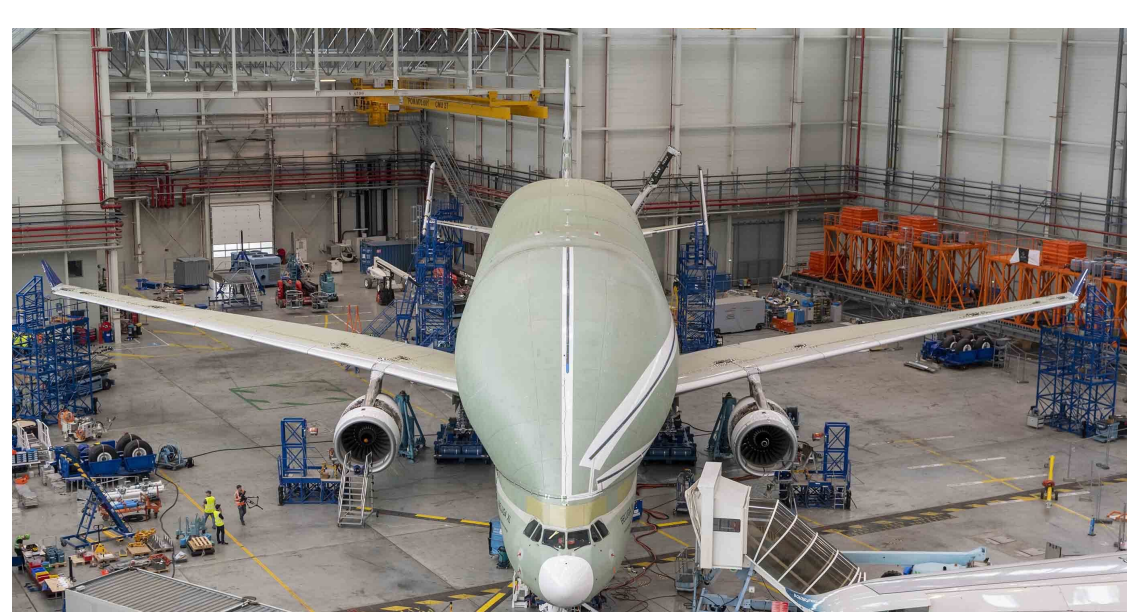
- › Siemens Simcenter TestLab
- › Matlab / Simulink
- › dSpace ControlDesk

In-house software

- › Test planification and organization
- › Signal processing
- › Operational and experimental modal analysis
- › Development of custom software based on .NET, Python, Matlab, Julia

Recent tests

Commercial aircraft



Beluga XL AIRBUS / Toulouse



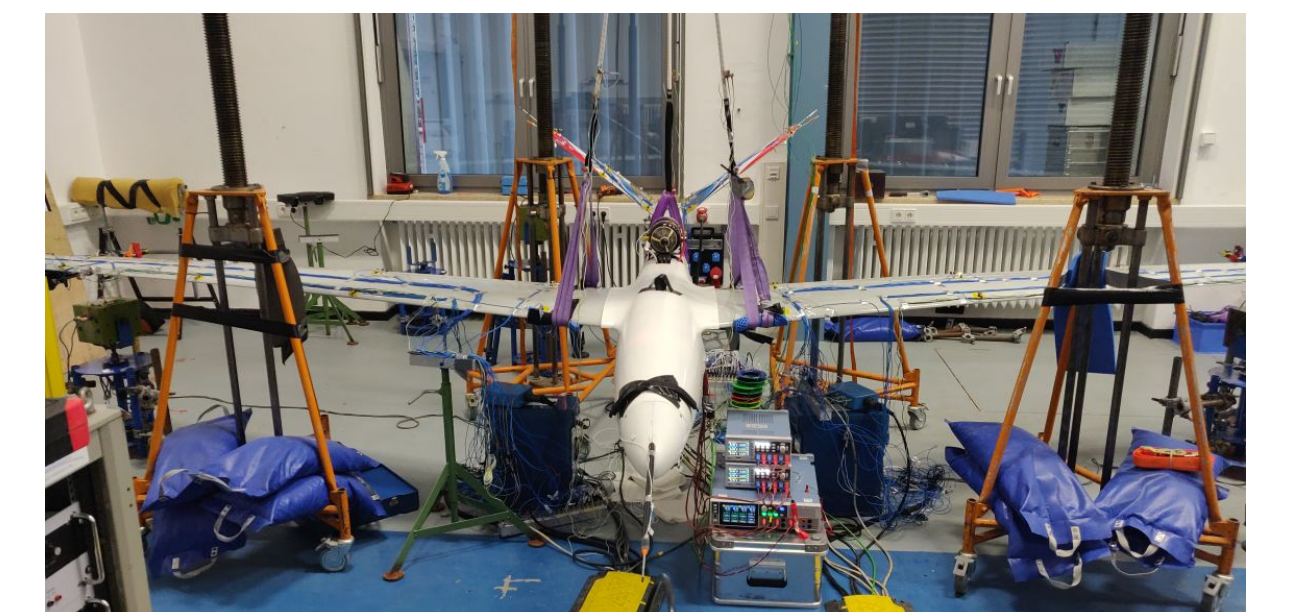
Falcon 6X Dassault Aviation / Mérignac

Light aircraft



Solar Stratos ONERA / Meudon

Drones



FLIPASED P-FLEX DLR / Göttingen

Partners



Research Supports and Customers

