

## Laboratories for Data Acquisition and Measurements

### *Type of Infrastructure*

The laboratories for Methodologies and Technologies for Data Acquisition and Measurements have the task of design, build, and maintain in full efficiency methodologies and systems of measurement, both standard and innovative, to support facilities and projects inside and outside CIRA, as well as experimental vehicles and payloads. The main measurement methodologies currently covered:

- Experimental aerodynamics
- Ice accretion, cloud characterization, two-phase flows
- Combustion
- Experimental aerothermodynamics
- Mechanical characterization and non-destructive evaluation and testing.
- Metrology

### *Main technical features*

- Standard and Dual Color thermography
- Implantation and detection of 7Be
- Measurements and characterization of emissivity of high temperature materials
- Plasma characterization by means of Emission and LIF Laser Induced Spectroscopy
- Calibration techniques for temperatures, pressures, heat flow sensors
- Mechanical characterization tests
- Non-destructive testing by means of LIT Lock-In Thermography
- Fiber optic sensors
- 2C & 3C PIV – Particle Image Velocimetry and Time-Resolved PIV
- Turbulence measurements (Hot wire anemometry)
- Pressure measurements (static and dynamic pressure transducers, PSP)
- Flow pattern visualization (Schlieren system)

### *Application Domains*

Aerodynamics, Aerothermodynamics, Metrology, Material Characterization Tests, Calibrations, Test Processes

### *Main measuring instruments/techniques*

Advanced technical instrumentation such as Lasers, Calibration benches, Thermal imaging cameras, Optics and accessories, Calibration ovens, Primary and secondary samples.

### *Operational Status*

Fully operational