



ALTER TECHNOLOGY TÜV NORD

**Evaluación de conformidad para una operación segura:
Calificación de Tecnologías fotónicas en el ámbito de los Drones**

November 2017



ENERGY



IT



MOBILITY



HEALTH AND NUTRITION



NATURAL RESOURCES



AEROSPACE & ELECTRONIC

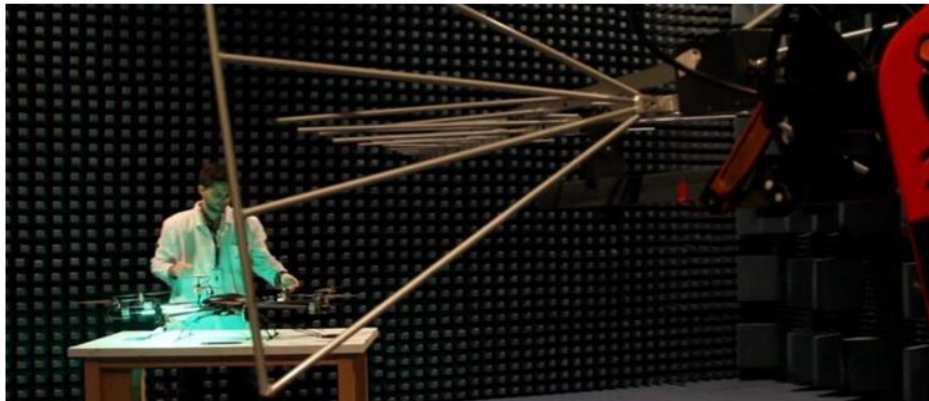
ALTER TECHNOLOGY TÜV NORD (ATN)



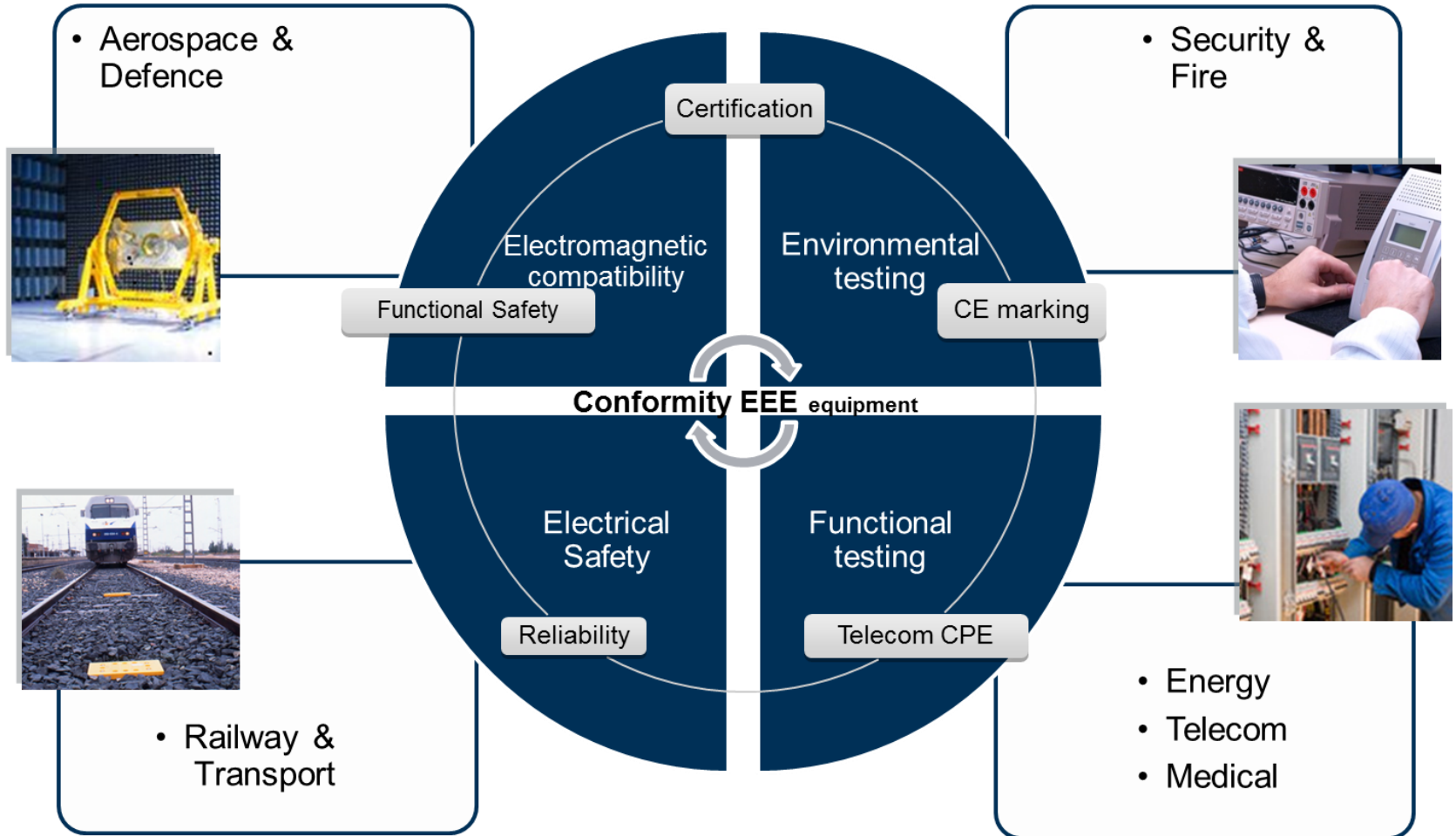
- **Microelectronics, optoelectronics and MEMS for high reliability & high-tech fields**



- **Equipment & systems testing**
- **Certification & engineering**



ATN: ENGINEERING, TESTING & CERTIFICATION



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- Accredited CERTIFICATION BODY (EN 17065:2012): N°107/C-PR261
- European NOTIFIED BODY (NB 2031)
 - EMC Directive: 2014/30/EU Electromagnetic compatibility
 - RED Directive: 2014/53/EU Radio
- Accredited TESTING LABORATORY (EN 17025:2005)
 - Scope: N° 345/LE808
 - MIL-STD-461 (EMC) / 810 (Environmental)
- RTCA/DO-160

- ### ENTITY
- INDEPENDENT
 - IMPARTIAL
 - CONFIDENTIAL



INTERNATIONAL RECOGNITION

- NIST: National Institute of Standard and Technology (USA) - EMC
- NATA: National Association of Testing Authorities (AUSTRALIA) – EMC and Safety
- RRA: Radio Research Agency (SOUTH KOREA) - EMC

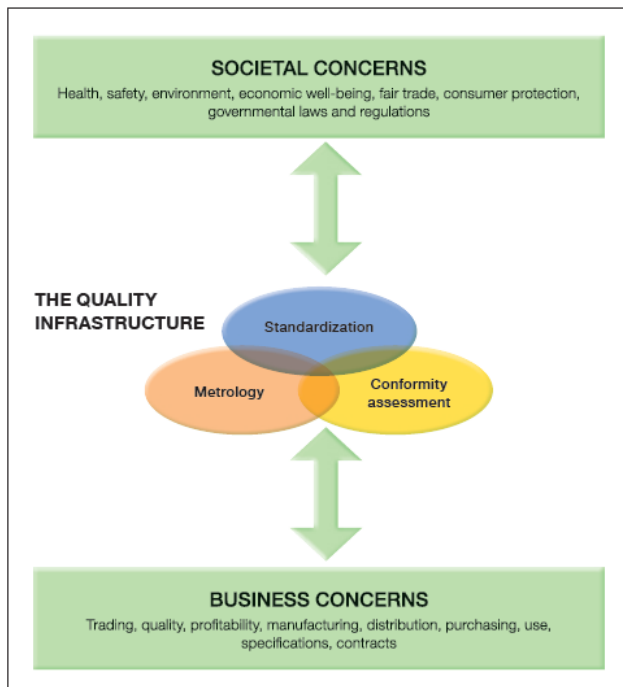
iac EA European co-operation for Accreditation IAF INTERNATIONAL ACCREDITATION FORUM CCA CERTALARM

**ALTER TECHNOLOGY TN
CONFORMITY ASSESSMENT
BODY**

ATN: CONFORMITY ASSESSMENT - METHODOLOGY

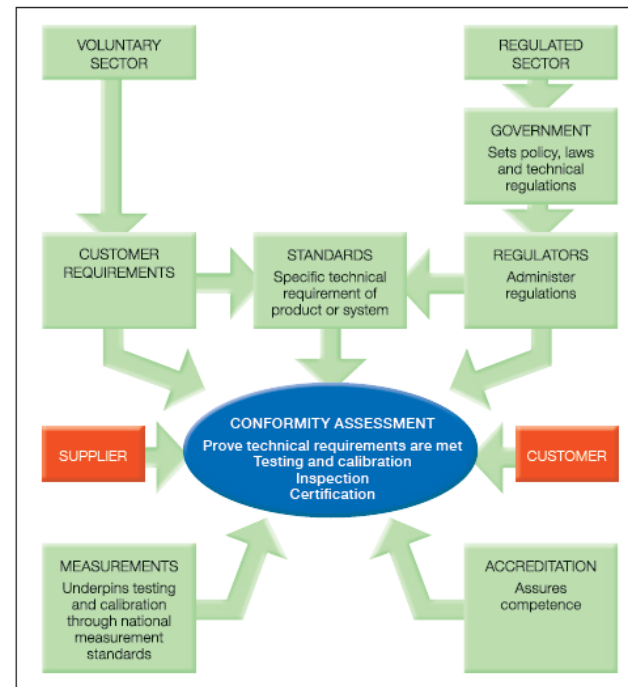
- **The role of conformity assessment in the quality infrastructure and its importance to trade capacity building and economic development**

Figure 1 – The role of the quality infrastructure



- **ISO/IEC 17000 defines CONFORMITY ASSESSMENT as : demonstration that specified requirements relating to a product, process, system, person, or body are fulfilled**

Figure 2 – Example of a conformity assessment model



EASA on Annex II – Product Legislation Framework

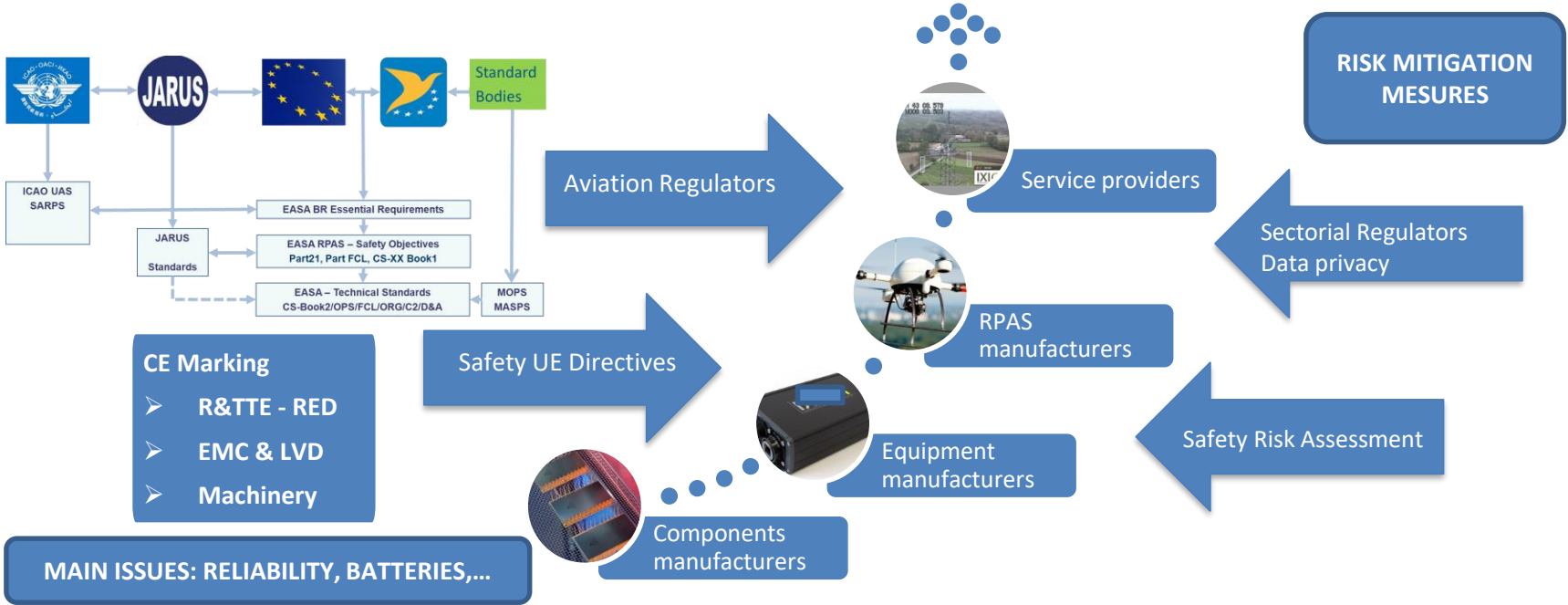
The **conformity assessment procedures** may range from a simple declaration of conformity by the manufacturer to a thorough verification based on full quality assurance for the manufacturer and assessment of the design of the product by a **conformity assessment body** notified by the Member State



ATN: CONFORMITY ASSESSMENT – REQUIEREMENTS

COMMERCIAL RPAS VALUE CHAIN

END USER



Component manufacturers

- GNSS components
- Antennae
- Sensors
- Batteries

Equipment & payloads manufacturers

- Avionics
- Communication
- Telemetry
- Cameras...

RPAS manufacturers

- Fixed wing
- Rotocraft
- Tilt rotor
- Arishop ...

Operators & Service providers

- Surveillance
- Security
- Safety / Hazards
- Facility Inspections

ATN: CONFORMITY ASSESSMENT - TECHNIQUES

Safe RPAS Operation

Where is the RISK?

- ✓ Specific Operations Risk Assessment
- ✓ Adequate Risk Mitigation Measures
- ✓ Acceptable Means of Compliance-AMC

AMC for:

- Communications systems
- Safe termination flight
- Geofencing systems



IP Grade
IK Grade
ATEX Directive
RoHS Directive



Vibration



Radiation

Electric & Magnetic Fields



Extreme Temperatures



Saline Environment



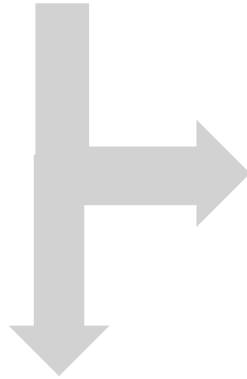
Acts of Illicit Interference



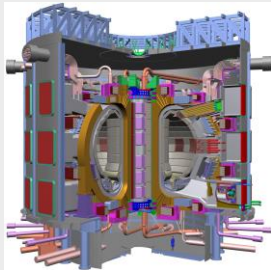
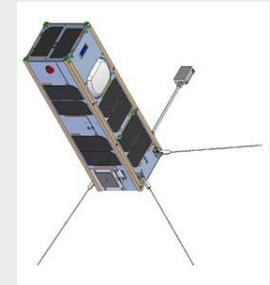
ATN STRATEGIC DEVELOPMENT AXIS



SPACE



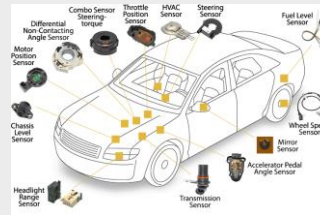
NEW SPACE



NUCLEAR



DUAL



SENSORS



HIGH RELIABILITY

✓ Innovation

✓ High tech

✓ Breakthrough technology

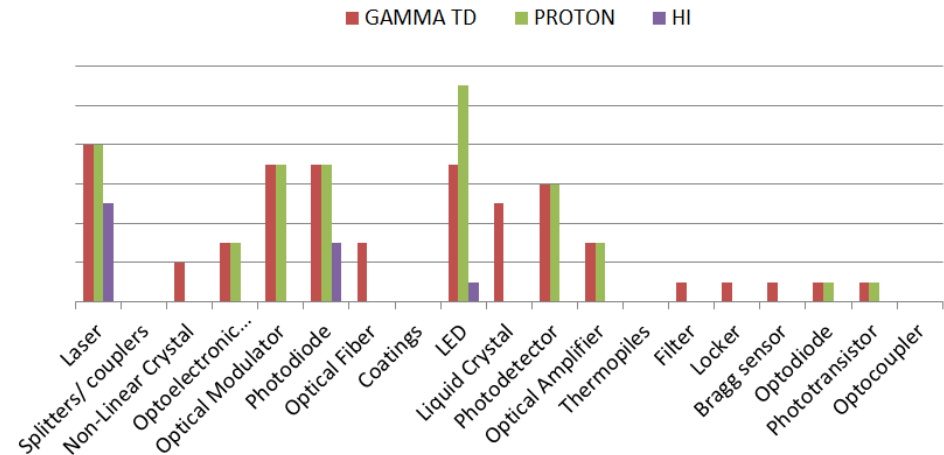
✓ High added value

✓ Skilled staff

✓ Collaborations

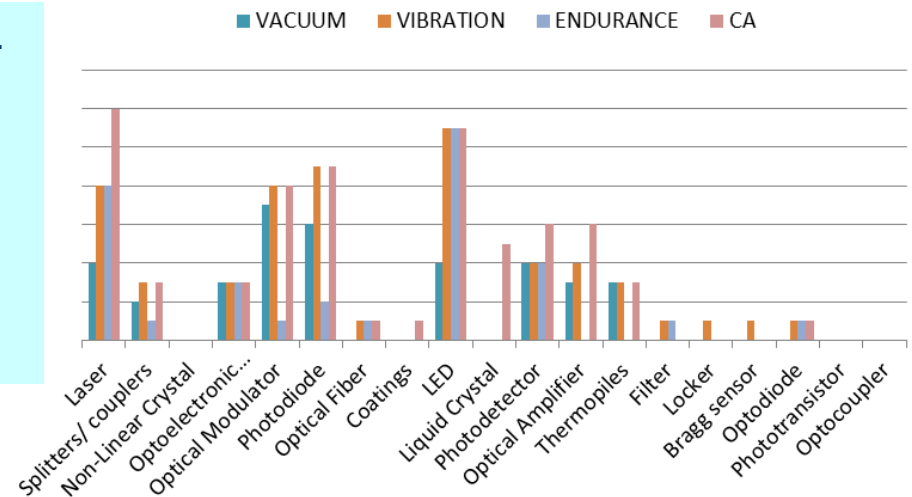
Range of photonics parts

ALTER TECHNOLOGY has gathered a large experience in optical and reliability testing on photonics parts covering the full range of different technologies. A detailed data base is available showing reliability data of a large number of parts.



Complete range of optoelectronics and photonics parts

- Laser & Leds characterization 250 to 5000 nm.
- Receivers modules (180 to 11000 nm).
- Optical Amplifiers & Optical modulators
- Switches and splitters.
- Optocouplers & Photodiodes
- Multimode and monomode Fibers
- Liquid Crystal Devices
- Image Sensors



EVALUATION OF NEW TECHNOLOGIES FOR HARSH ENVIRONMENT - PHOTONICS



Specific Testing Resources

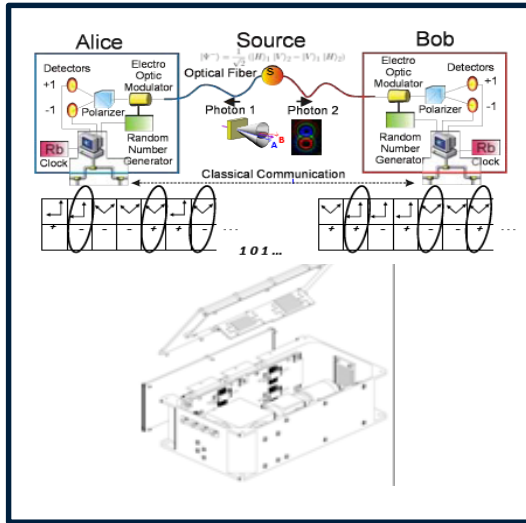
- Clean area with laminar flow chamber (class 100).
- Optical table with vibration stability.
- Free ESD area.
- Lasers 1064, 1310 and 1550 with modulating option (up to 20 GHz).
- Integrating sphere (250 – 2500 nm) and detectors.
- Spectrum Analyser (600 – 1750 nm, resolution 20 pm).
- Return loss and OTDR analyser.
- Optical attenuators and splitters.
- Monochromator (180nm – 2200nm & 2000 nm – 12000nm).
- Translation and rotation positioners.
- Climatic chambers (thermal shock -185°C to 300°C , life, etc...).
- Mechanic test system (Pull, push, torsion test).



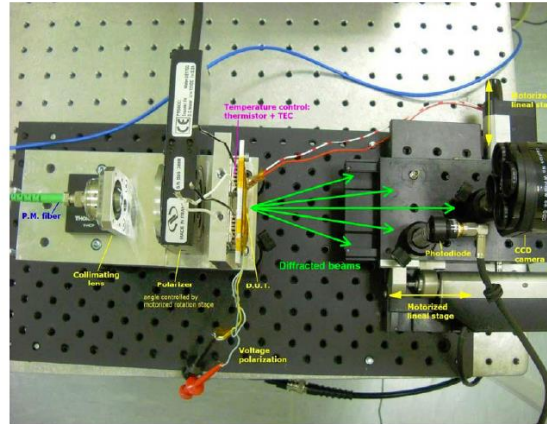
DEVELOPMENTS OF PHOTONICS SYSTEMS



Quantum transceiver for optical communications

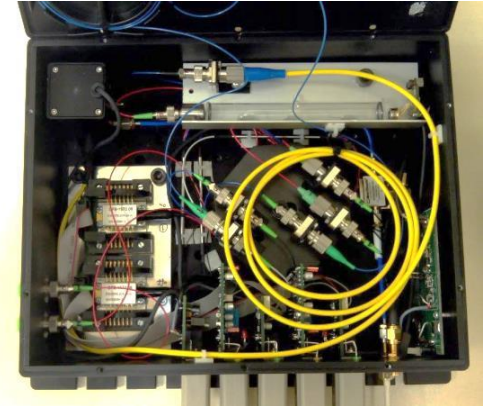


Laser beam steering based on liquid crystals

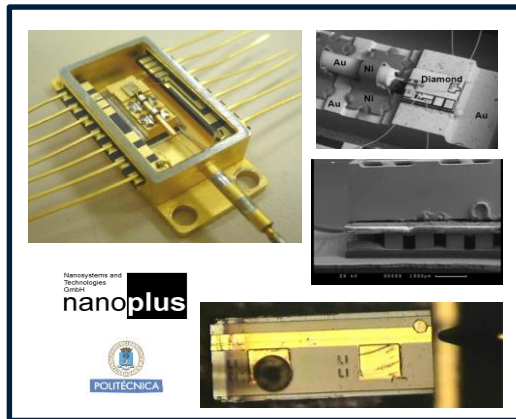


Overview of measurement bench

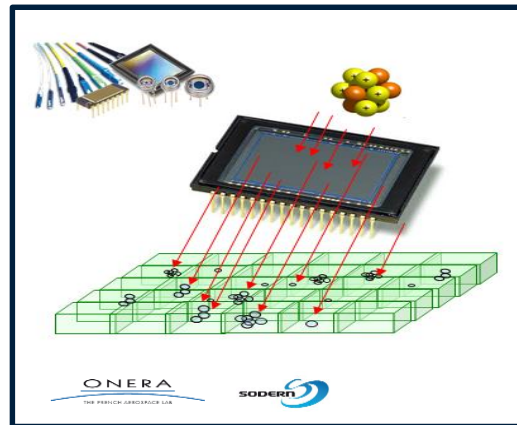
Frequency stabilization Unit for LIDAR application



2.1 um SWIR Laser



Radiative Optoelectronic Components Vulnerability



Optical Transceivers





THANK YOU!

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