Nondestructive Testing Systems for Industry

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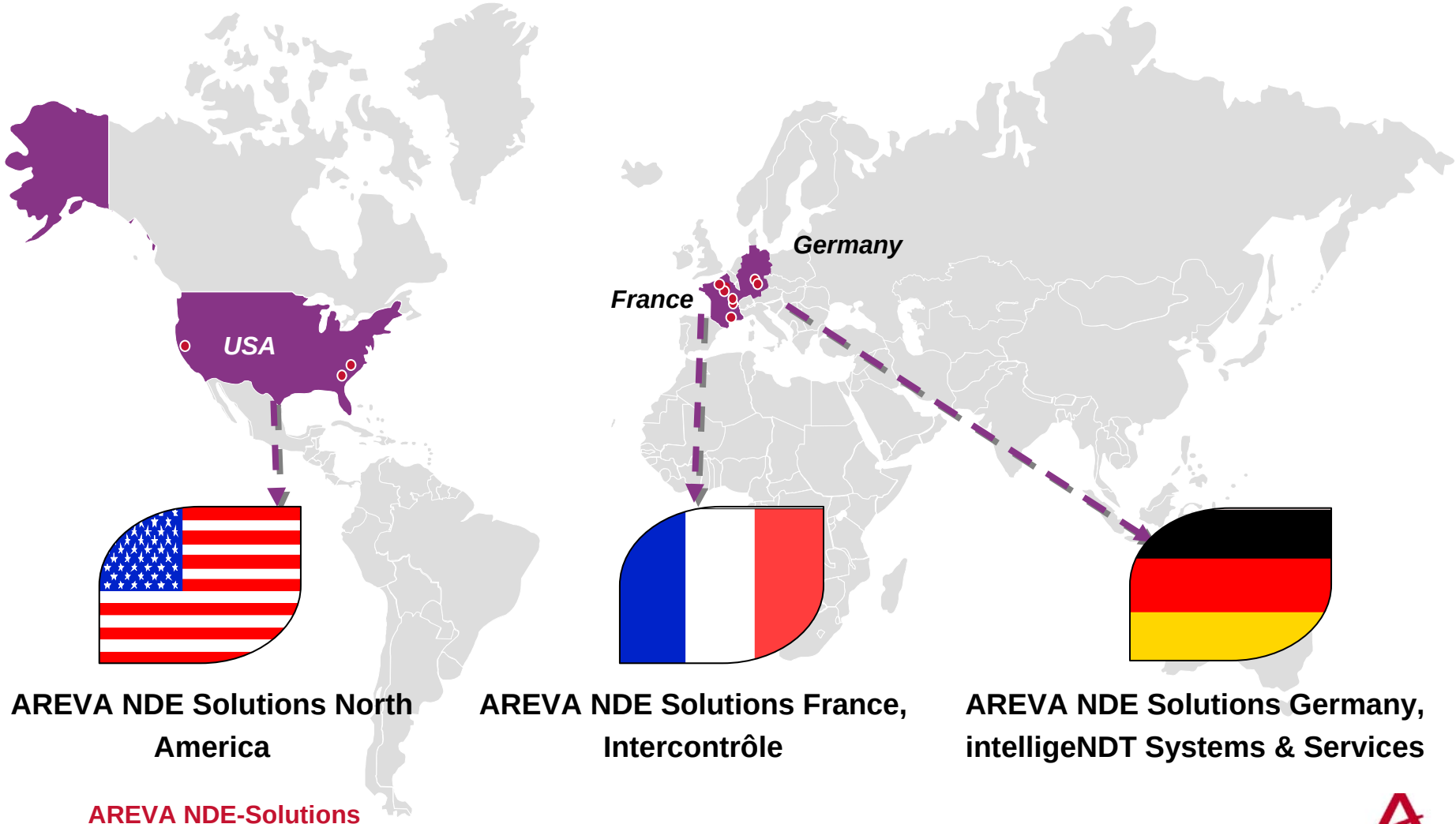
Munich, VDI-TUM-Expertenforum April 17 2012

AREVA NDE Solutions

A Global Organization with more than 700 NDE Professionals



AREVA NDE Solutions North America

AREVA NDE Solutions France, Intercontrôle

AREVA NDE Solutions Germany, intelligeNDT Systems & Services

AREVA

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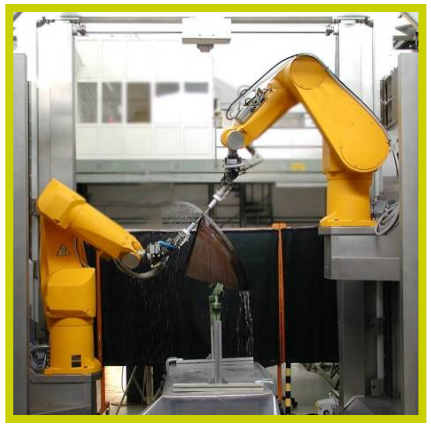
Business Areas



Aviation

Automotive

Trains

Steel

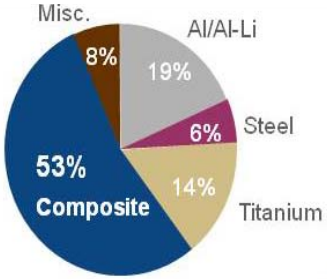
intelligeNDT Systems & Services GmbH
CFRP Inspection - A350 XWB

Why ultrasonic NDT on CFRP Components?

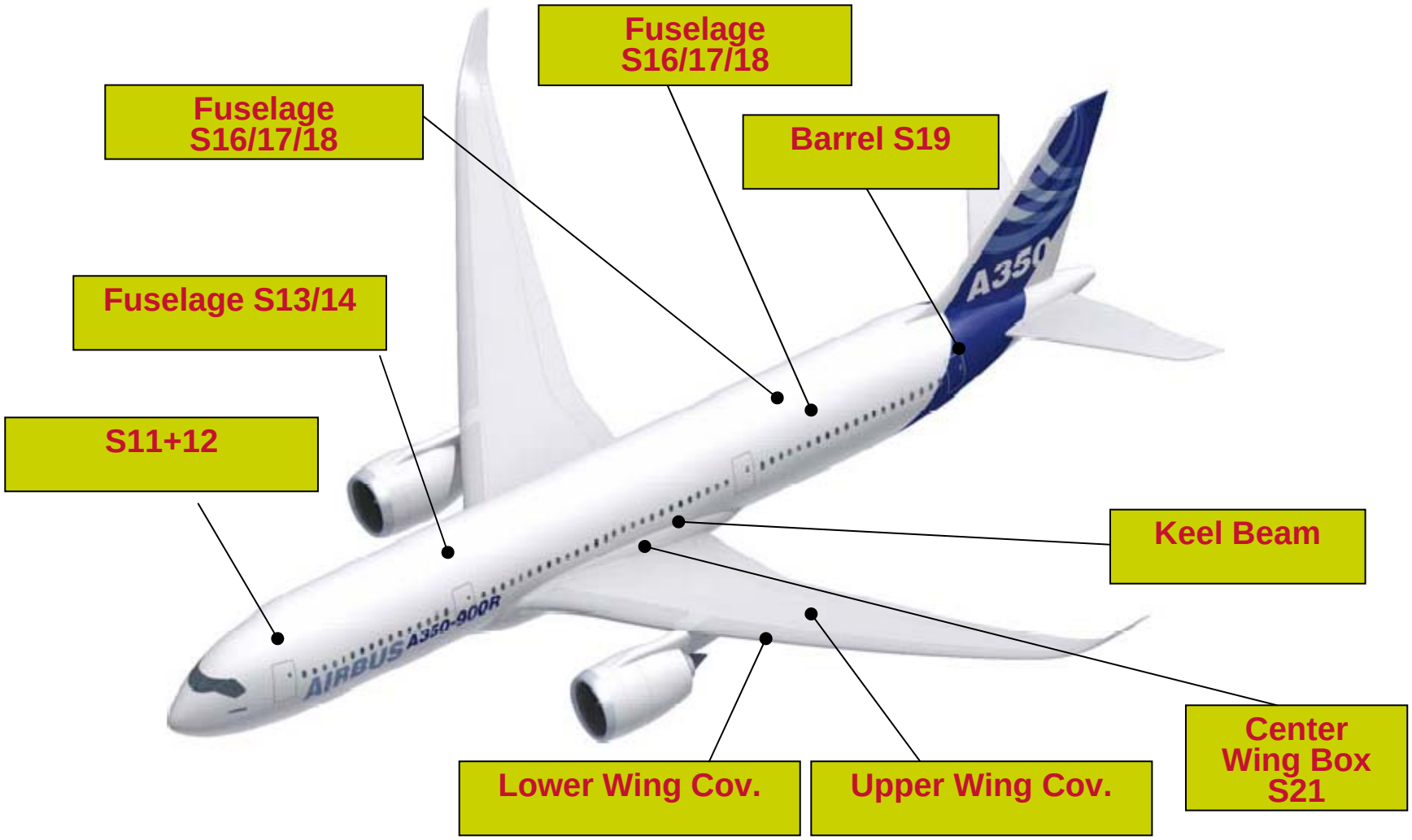
- Inclusions
- Delaminations
- Lack of fusion
- Porosity

  are detectable using Ultrasonic Testing (UT)

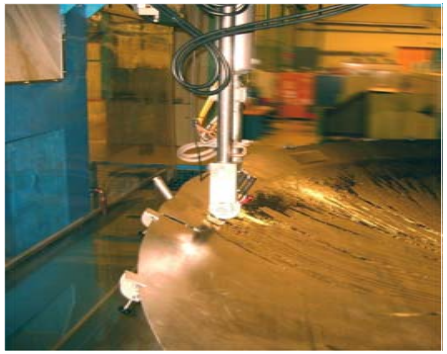
CFRP make up for more than 50% of Airplane structure!



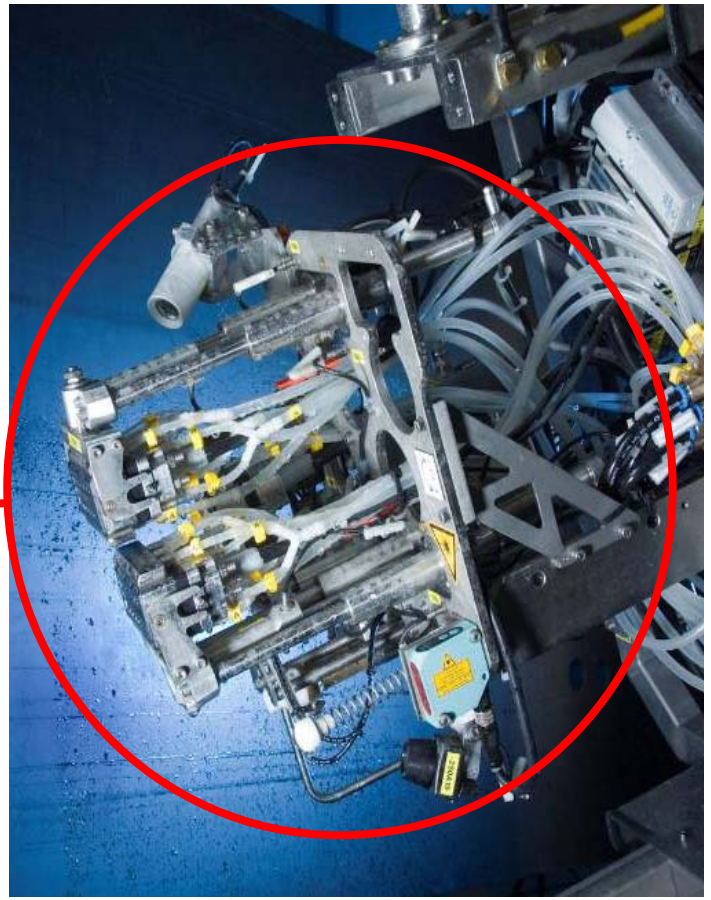
Typical Composite Components



Gantries



Dual Towers for Wing Covers

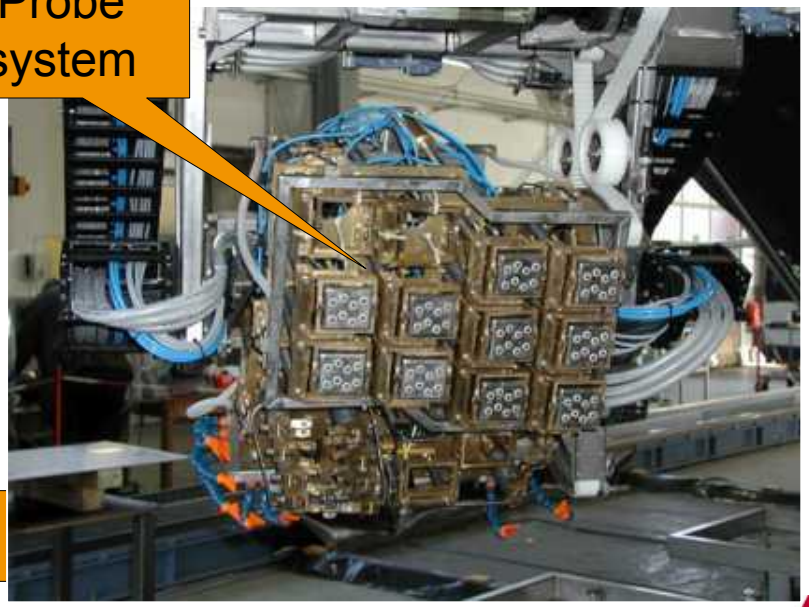


AREVA

Aviation – Contact Testing System

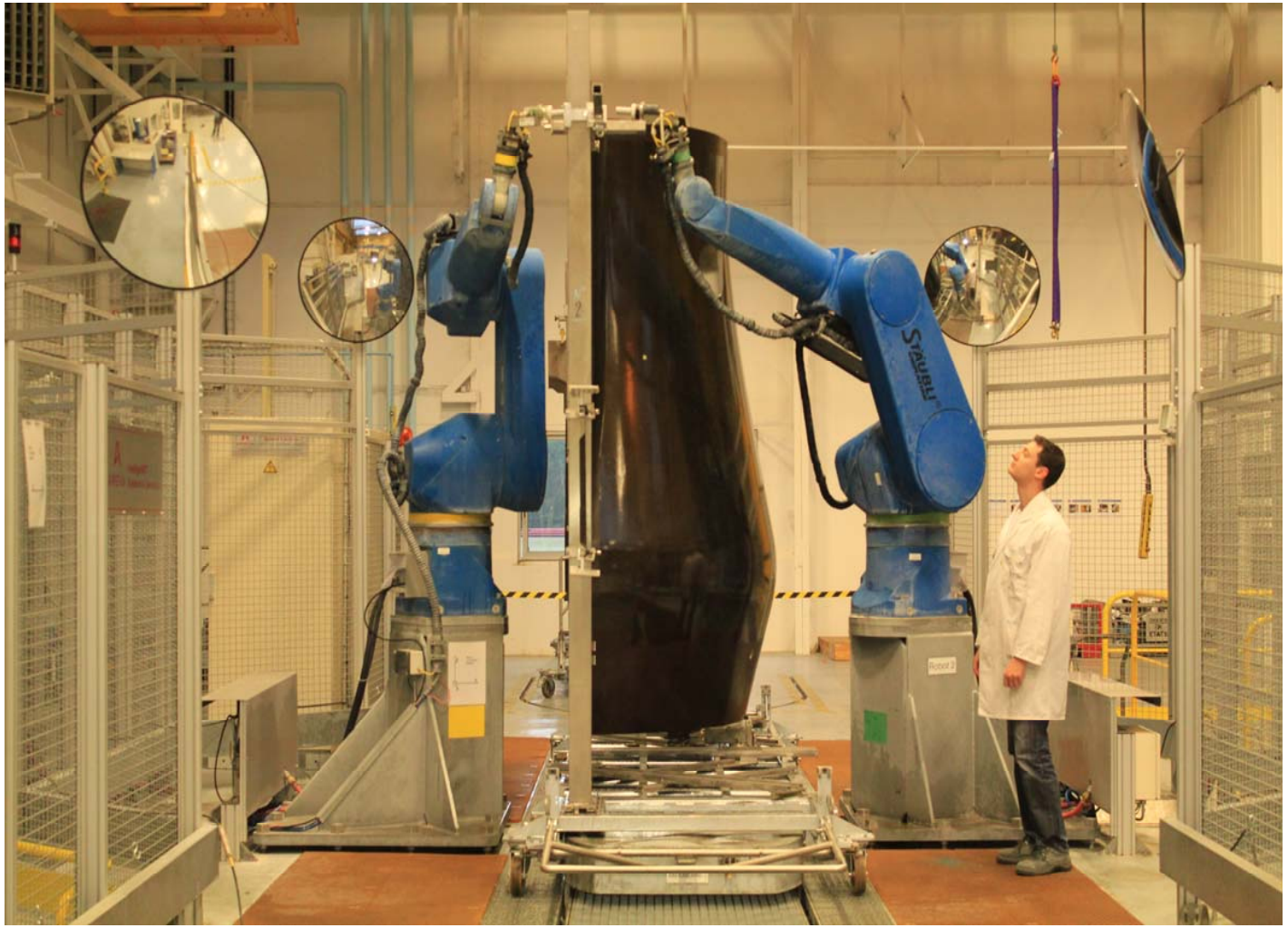
New Advanced, multichannel system No2

Multichannel inspection system for the rear pressure bulkhead and flat components



Special Designs

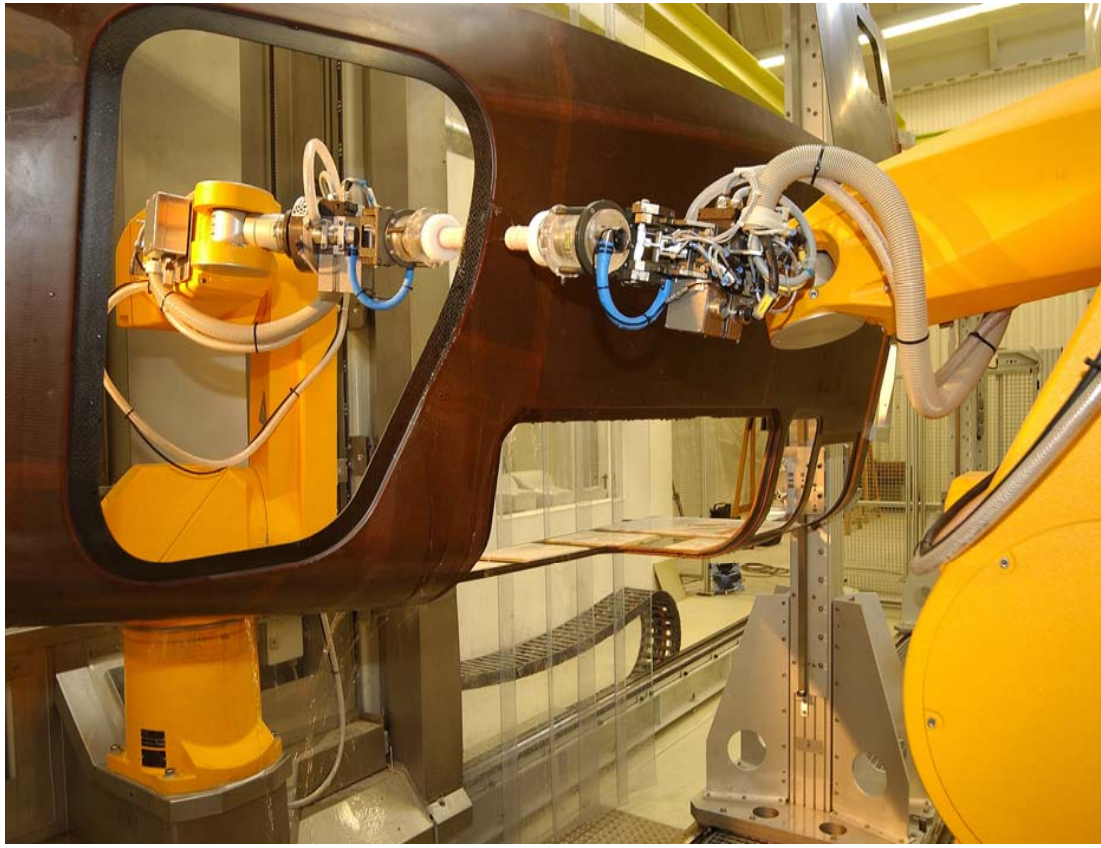
Robots



Robotics

Pulse Echo or Through Transmission

Dual Robots or Single robots

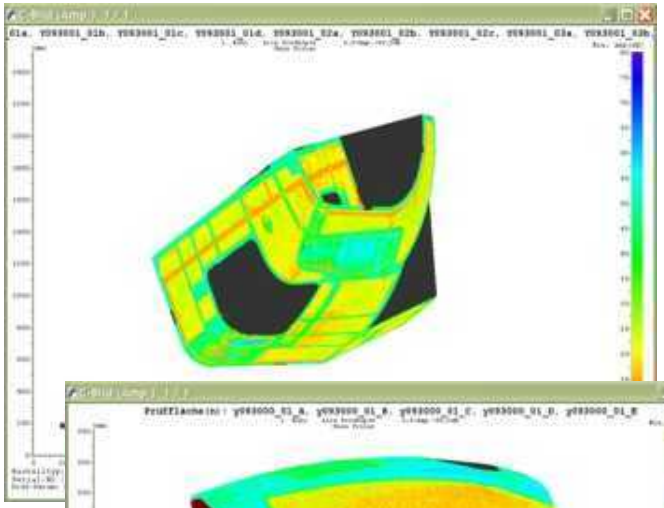


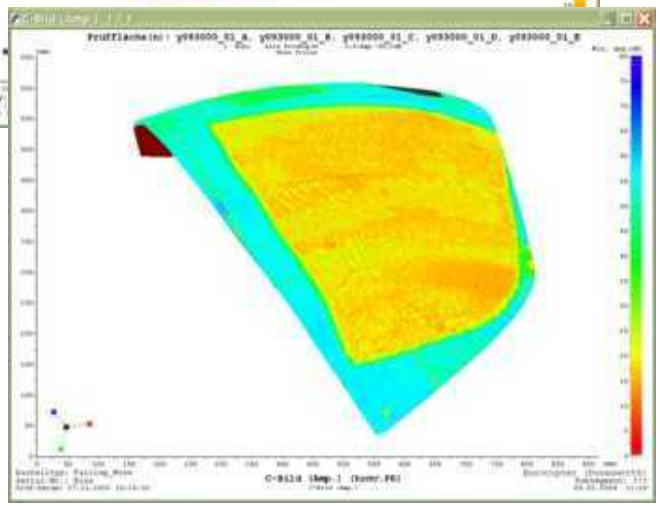
Mono Robot Systems - Small table Top

Small single robot system :

- **contact technique for laminates**
- **Laboratory application**
- **Budget: 200 k€**

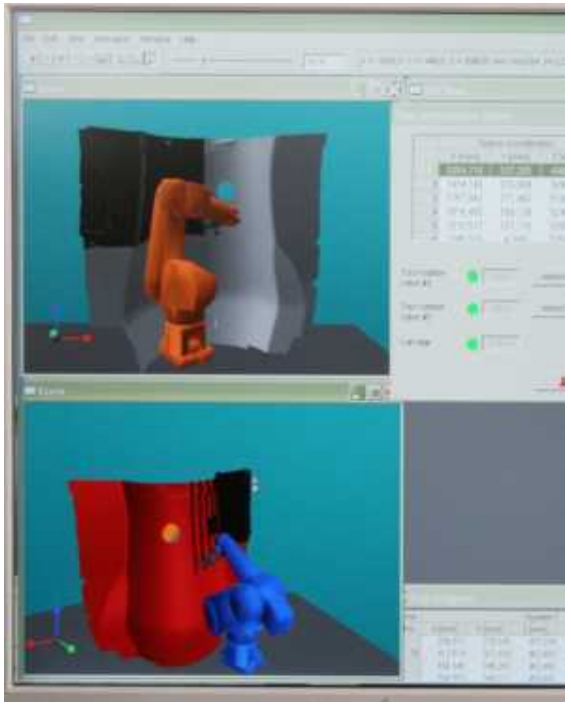
Aviation - Software Tools





Off Line Programming OLP

- Scan plan generation
- From CATIA export files
- Automated scan plan generation
- Simulation for robotic systems

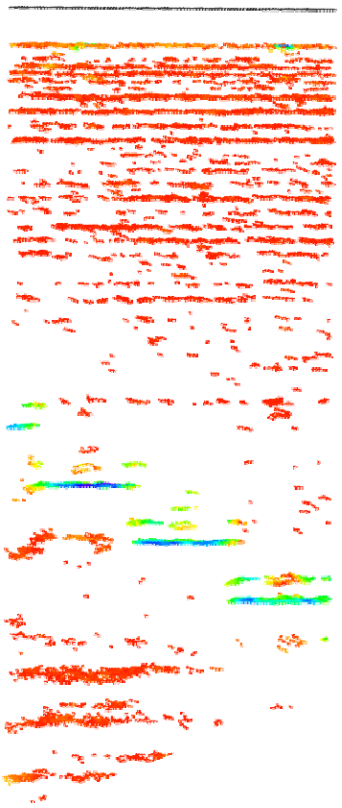


Evaluation

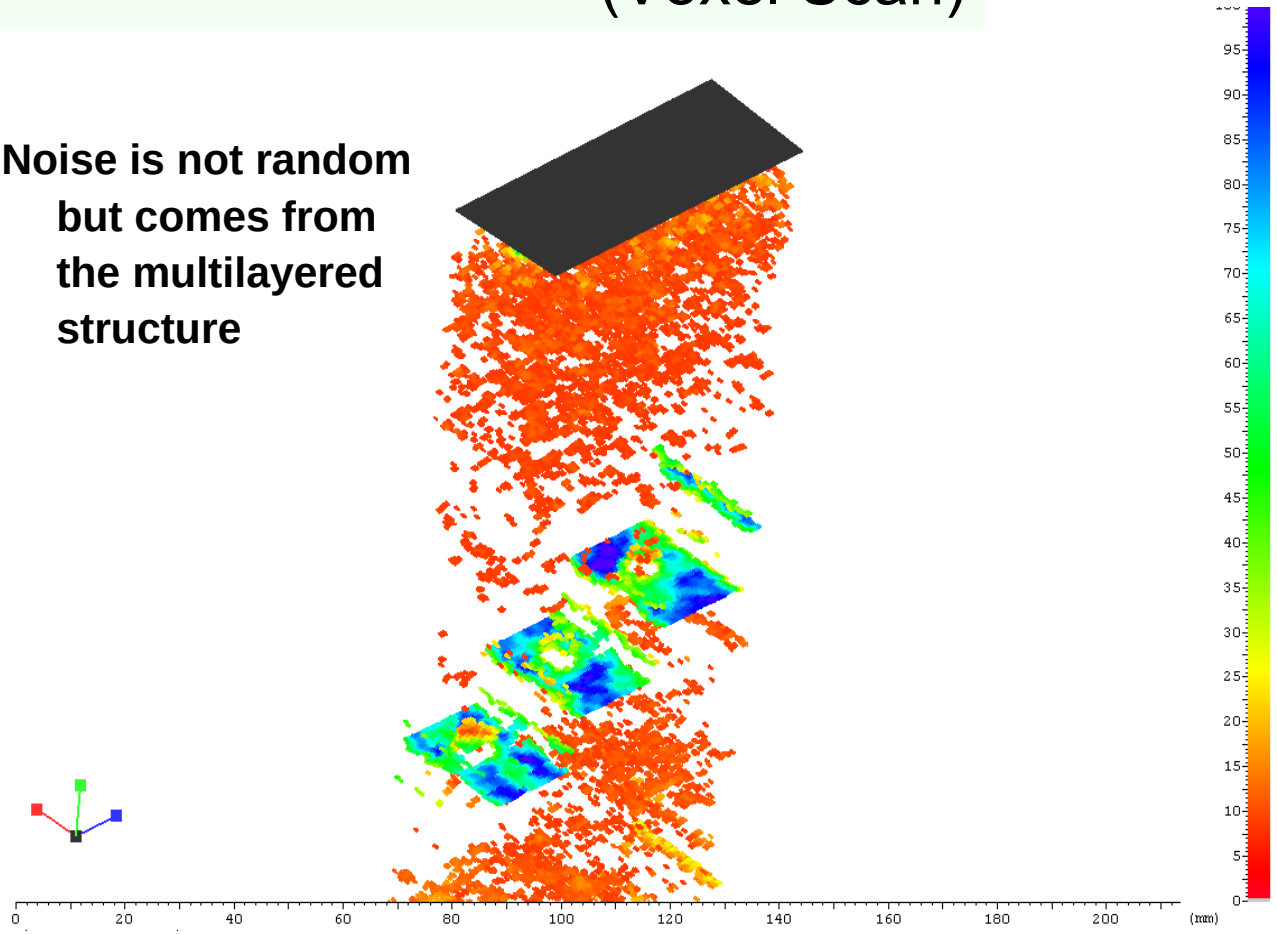
- 3 D evaluation
- Special software for large data volumes
- 2 D / 3D visualization for sizing
- Traceability of evaluation status and approval

Robotics 3D Evaluation

Data Reduction for A Scan Data (Voxel Scan)

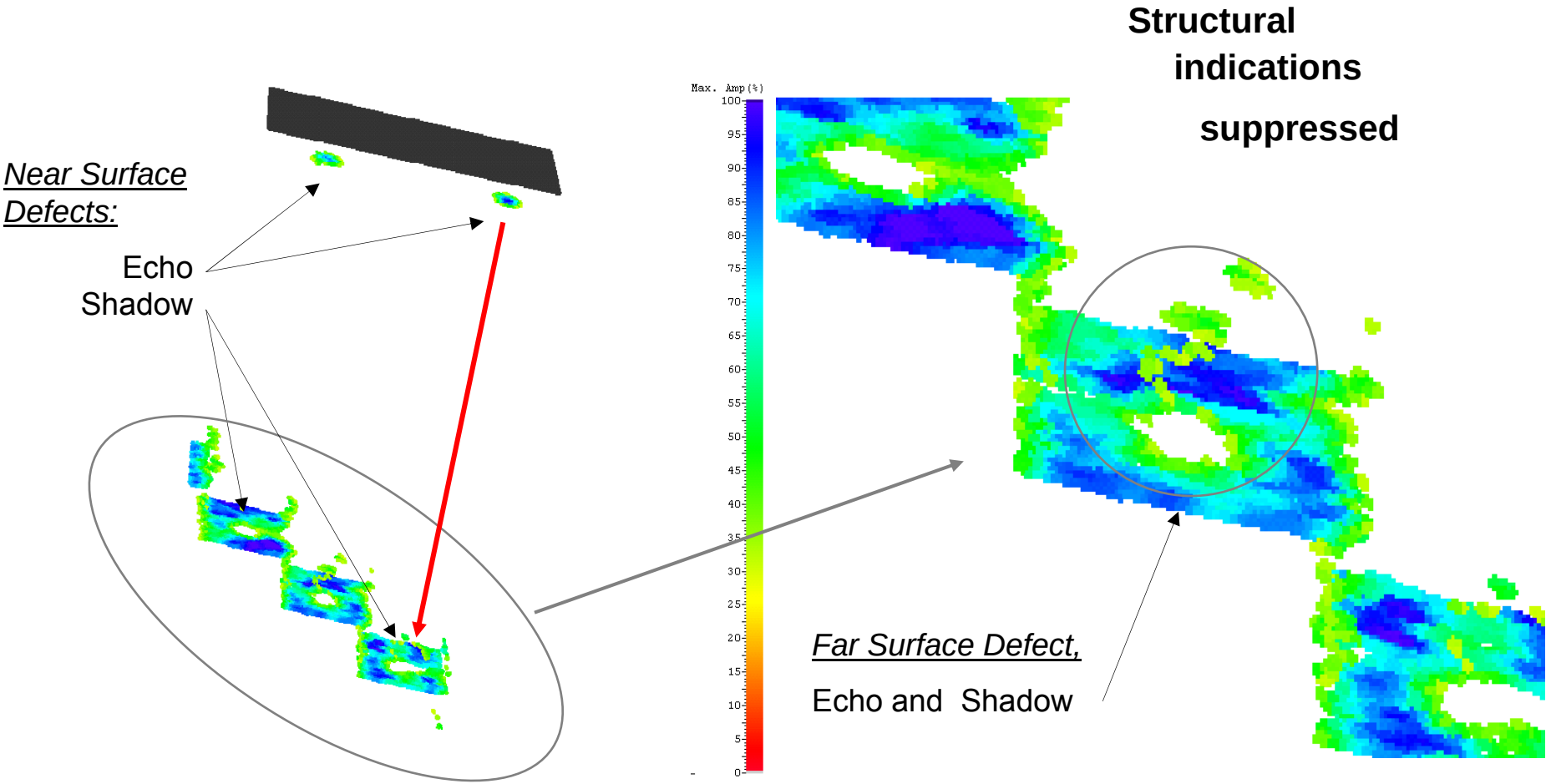


Noise is not random but comes from the multilayered structure



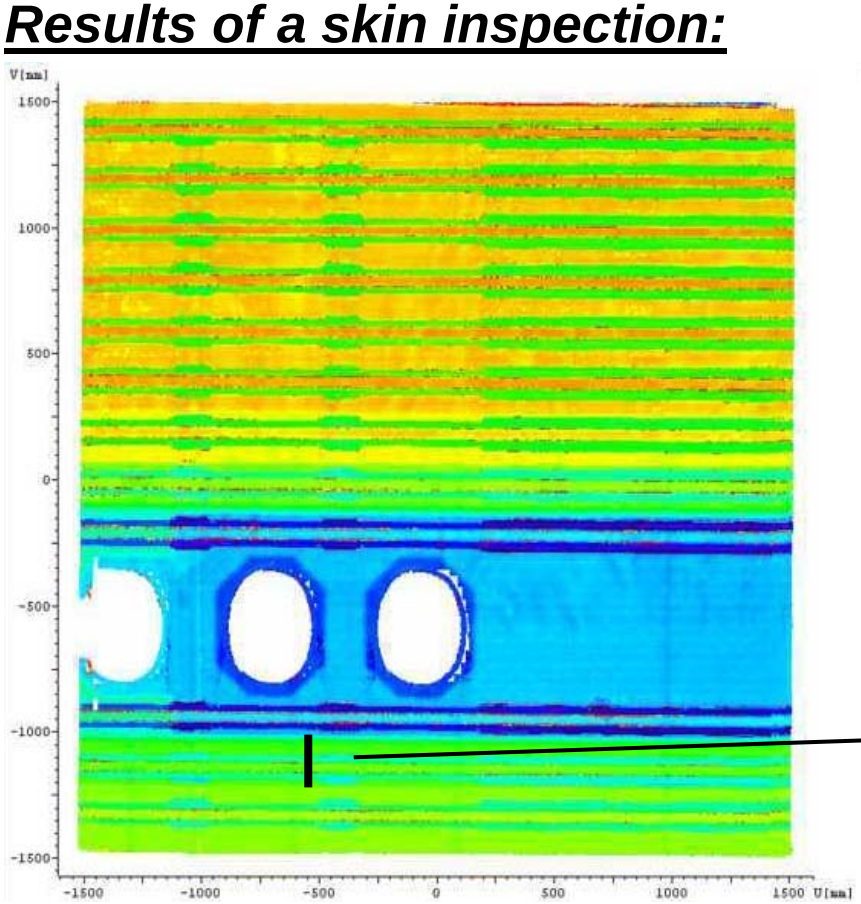
Robotics - 3D Evaluation

Step Wedge Detail



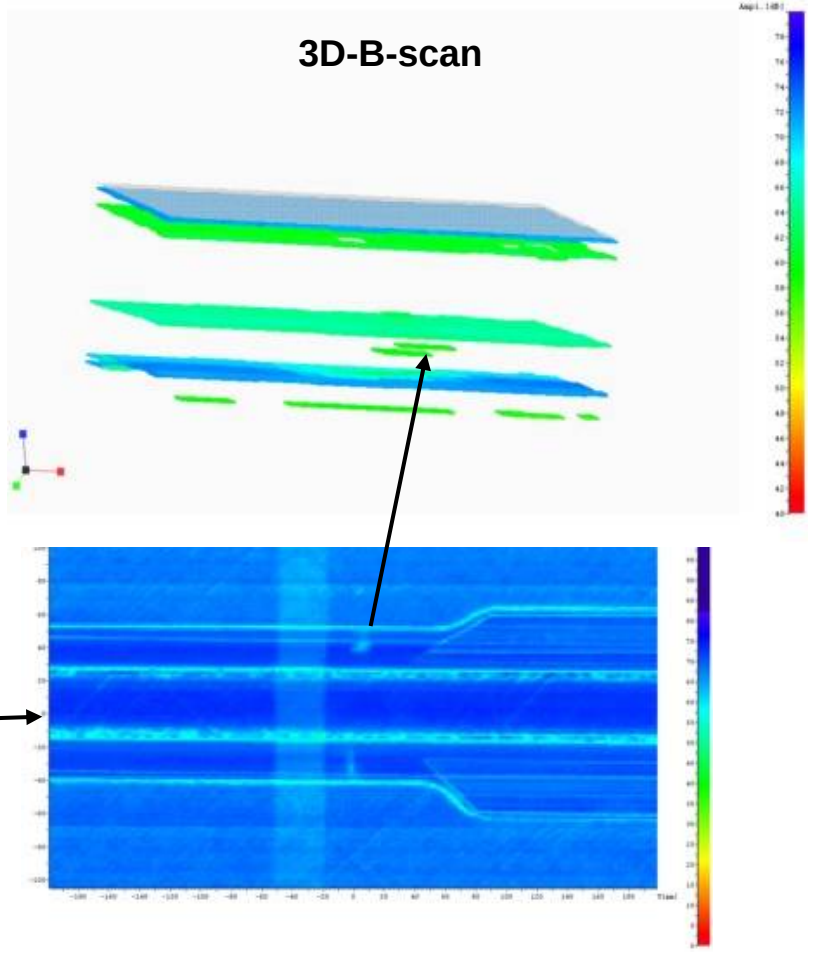
Evaluation – Data Overlay

Results of a skin inspection:



D-Bild

3D-B-scan



Current state of the art:

- Straight incidence
- Echo recording

Possible developments:

- Spectral analysis → small wall thicknesses
- Variation in propagation velocity → stiffness
- attenuation → curing status
- oblique incidence

Thank you for your attention!

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