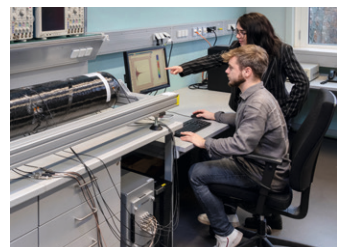


GUIDED WAVES AND SHM

Our Expertise

Ultrasonic inspection techniques and structural health monitoring (SHM) systems using guided waves for application on plate like structures, pipelines and fiber reinforced plastics



SHM with guided ultrasonic waves on hydrogen pressure vessels

Our Services

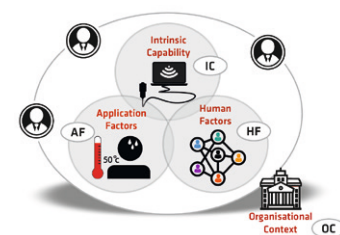
- Modeling, simulation and experimental investigation of ultrasonic guided wave propagation for flaw detection
- Inspection techniques for flaw detection in extended components and structures (e.g. plates, pipelines)
- Design, development and qualification of structural health monitoring systems for safety relevant components
- Methods and systems for evaluation and monitoring of fiber reinforced plastics
- Adapted excitation and detection techniques for guided waves

Dr.-Ing. Jens Prager
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RELIABILITY ASSESSMENT AND HUMAN FACTORS

Our Expertise

Holistic reliability assessment of non-destructive testing methods under systemic consideration of the influences of human factors



Different factors influence the reliability of NDT

Our Services

- Consulting on the methods and criteria for the holistic reliability assessment
- Investigation of the influence of human factors on the reliability of NDT
- Human factors (HF) systems approach: HF as a function of interaction people, technology, group, organisation and the organisational environment
- Empirical studies and hypotheses testing
- Human risk assessment (Human Failure Modes and Effects Analysis; HF-FMEA) and human reliability assessment
- Human-machine, human-automation, human-AI interaction
- Acceptance of new technologies (AI, Hydrogen)
- Usability testing and user-centred design (ISO 9241), eye tracking, design thinking

Dr. phil. Marija Bertovic
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OUR EXPERTISE AND SERVICES

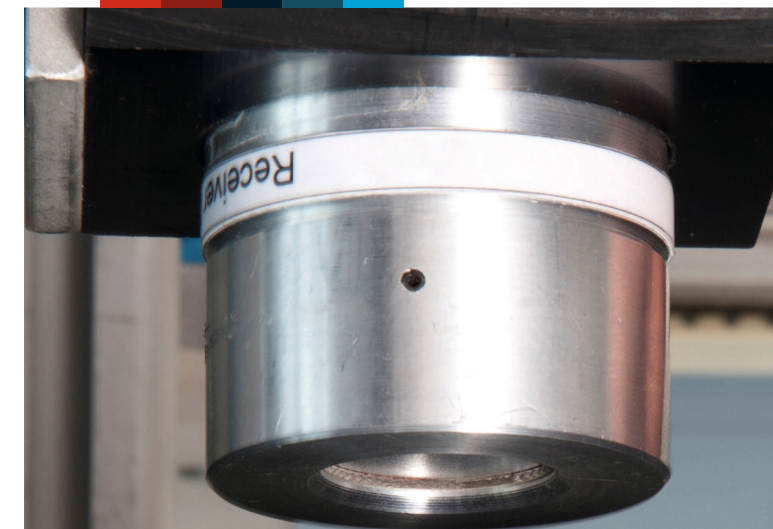
- Non-destructive testing (NDT) using ultrasonic and electromagnetic methods
- Design and development of optimized NDT procedures
- Research of advanced methods for material testing and -characterization
- Simulation and modeling of inspection methods
- Visualization and reconstruction of test data for improved defect detection and evaluation
- Validation of NDT procedures and reliability
- Influence of human factors on NDT reliability
- Accredited testing laboratory in accordance with DIN EN ISO 17025
- Research and development
- Feasibility studies, surveys and advisory services
- NDT-service and procedures for special testing problems

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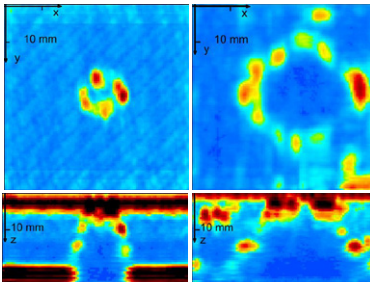
ACOUSTIC AND ELECTROMAGNETIC METHODS

Division 8.4

ULTRASONIC TESTING

Our Expertise

Ultrasonic testing and special techniques for volumetric non-destructive inspection of high-performance materials, complex geometries and composites



Impact damage in CFRP components (top and side view: delamination, entrance and backwall echo)

Our Services

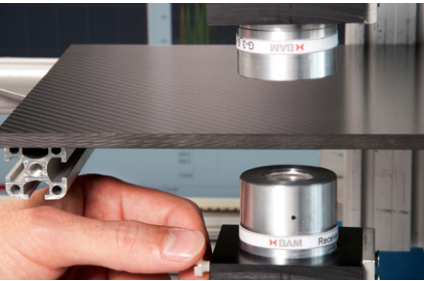
- Theroretical and experimental examination of sound propagation
- Optimized inspection arrangements using linear and matrix array probes and in-house developed high performance multi channel devices
- Reconstruction methods for improved inspection reliability and flaw sizing
- Inspection and monitoring of components using different wave modes (e.g. plates, adhesive bonds, tubes)
- Optimized techniques for the inspection of inhomogeneous and anisotropic materials
- Development of probes and techniques for ultrasonic testing at high temperatures (< 1000 °C)

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AIR-COUPLED ULTRASOUND

Our Expertise

Air-coupled ultrasonic testing for materials with sensitive surfaces and for solid plates



Ultrasonic transmission of a CFRP plate with in-house developed transducers based on cellular polypropylene

Our Services

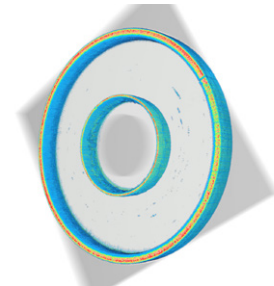
- Inspection of CFRP, GFRP, sandwich structures, porous materials, paper, textile, concrete, food products
- Inspection of adhesive joints
- Development of transducers based on cellular polymers
- Development of novel thermoacoustic transmitters and plasma-based acoustic sources
- Development of multi-channel devices for air-coupled testing
- Contact-free testing with guided waves
- Broadband laser-based acoustic sensors for frequencies up to 2 MHz

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IMMERSION TANK TESTING

Our Expertise

Mechanized high resolution ultrasonic immersion testing with a maximum of seven degrees of freedom for positioning of probe and specimen against each other



High resolution 3D scan of a part of a hollow axle (indications are non metallic inclusions)

Our Services

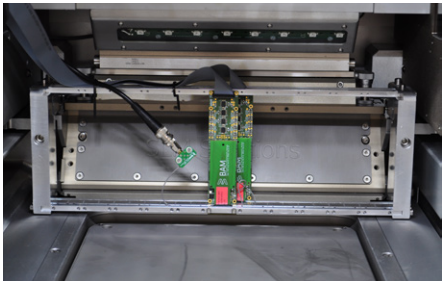
- Frequency range of 1 MHz up to 100 MHz
- Application of focal and non-focal probes
- Testing of components with complex geometries
- Phased array probes with linear or matrix arrangement with up to 128 elements and frequencies up to 20 MHz can be applied
- Inspection results are displayed using A-, B-, C-scan or volume scan images
- Determination of directivity patterns according to EN 12668-2
- Determination of cleanliness of steel according to SEP 1927 and ASTM E588

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ELECTROMAGNETIC TESTING

Our Expertise

Eddy current and magnetic flux leakage testing for the examination and testing of electrically conductive or ferromagnetic components



GMR sensor array for in-situ eddy current testing in additive manufacturing

Our Services

- Test method for the detection of near-surface inhomogeneities such as cracks, pores, inclusions, corrosion
- Development of optimized, problem-adapted eddy current and flux leakage probes
- Customized software for data acquisition, analysis and defect size determination
- Material characterization and identification (e.g. conductivity, ferrite content, layer thickness)
- Application and development of GMR sensors for the detection of micro-defects (magnetic microanalysis)

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