



[LBMS laboratory] EA 4325

Brest Laboratory of Mechanics and Systems

Studies carried out in the LBMS lab involve analyzing the life span of naval structures. This scientific project is developed through acquiring general expertise both in the field of material, fluid and structural mechanics and in the field of electromechanical systems control and diagnosis. Thus, the range of potential applications includes other industrial activities (automotive, aeronautics, etc.).

Research lecturers from ENSIETA, the University of Brest and ENIB work in this laboratory. The research activity more specifically developed at ENSIETA (within the MSN center) mainly focuses on the field of mechanics. Phenomena of fatigue, impacts and weathering or aging are studied, particularly for naval applications. In addition, special attention is given to taking the initial condition of the materials (metal, composites and elastomers) and structures into account.

The scientific approach to these problems combines theoretical modeling, experimental aspects and numerical simulation (finite elements, finite volumes and boundary elements).

> Themes

- Material and assembly mechanics
- Fluid, material and structure dynamics
- Control and Diagnosis of Electromechanical systems

> Main research themes

- Material behavior and fatigue
- Behavior of assemblies
- Dynamic behavior of materials and structures
- Naval hydrodynamics
- Fluid-structure interaction

> Fields of application

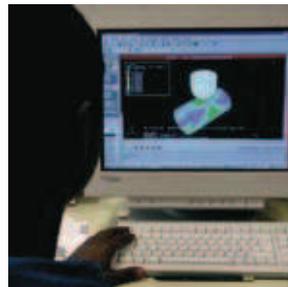
- Naval architecture and offshore engineering
- Applications in general mechanical engineering and the automotive field

> Doctoral studies and research-based training

- Doctoral school of Health, Information, Communications, Mathematics and Matter (ED SICMA 0373)
- Research-oriented master's degree, Field of « Science, Technology, Health » (UBO), on the topic of « Continuous environment physics and mechanics », Specialization in « Applied hydrodynamics » and « Materials and structures »



Test sample after compression



> Staff

- 18 research lecturers
- 12 doctoral fellows
- 5 technical supervisors
- 1 secretary

> Equipment

- Tensile testing machines
- Tri-axial fatigue platform (2,500 kN, 2X400 kN)
- Traction-torsion testing machine
- Shock test machine for fluids or solids (20 m/s)
- Hopkinson bars, Taylor gun
- Visco-Analyser
- Thermal video camera, High speed video camera
- SEM, Computing cluster
- Software (CATIA, Abaqus, CAST3M, Fluent, Matlab, etc.)

> Partnerships

- **RESEARCH AND DEVELOPMENT**
BUREAU VERITAS, DGA, IFREMER
- **INDUSTRIAL FIRMS**
ARCELOR-MITTAL, CDK, DCNS, HDS, PSA, STRYKER, TRELLEBORG, etc.
- **UNIVERSITIES**
Pôle Mécanique Brestois (Brest mechanical engineering cluster: ENSIETA, École Navale, ENIB, UBO, IFREMER) FEMTO, GEM, LMPM, LMT, LPMM, etc.
- **INTERNATIONAL PARTNERS**
- University of Southampton (UK),
- Heriot-Watt University (UK),
- Cranfield University (UK),
- University of Porto (Portugal),
- University of Liège (Belgium),
- Georgia Institute of Technology (US),
- University of Pécs (Hungary),
- Military Technical Academy of Bucarest (Romania),
- EMI (Morocco), etc.

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