

Reliability Laboratory

MISSION: Providing tools and expertise to improve the design & technology of sensors, actuators, microsystems, nanostructures and microelectronic components by assessing and building the quality & reliability in a Concurrent Engineering approach.

MAIN AREA OF EXPERTISE:

Reliability building:

- Design for reliability and testability - design for manufacture;
- Robust design of biosensors;
- Reliability monitoring & screening of micro and nanostructures;
- Reliability of components used in harsh environment (nuclear, geology, automotive, aeronautics, etc.);

Reliability assessing:

- Accelerated testing of micro and nanostructures;
- Failure analysis & physics;
- Data processing & Reliability prediction;
- Behaviour of electronic components in harsh environment;
- Virtual prototyping;

Standardization:

- Certification;
- Qualification and periodic tests;
- Standards and other specifications.

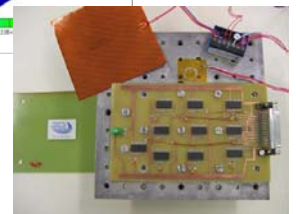
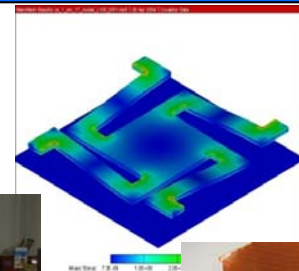
SPECIFIC EQUIPMENT for:

Reliability testing:

- Storage at temperature (up to 200C)
- Mechanical shock (Free fall)
- Damp heat (+10...+80C; RH = 20...95%)
- Thermal cycling (-65C...0 / +60...+200C)
- Combined tests: temperature + low air pressure (10...1100 mbar)
- Combined tests: vibrations + thermal & electrical stimuli
- Combined tests: mechanical stress (tilting) + temperature
- Combined tests: temperature + electrical bias

Electrical characterisation:

- Electrical measurements (Keithley 4200)
- Temperature conditioning for electrical measurements (-20...+225C)



RESEARCH TEAM

Dr. Marius Bazu, Senior Researcher
Dr. Lucian Galateanu, Senior Researcher
Eng. Virgil Emil Ilian, Senior Researcher

PROJECTS / RESULTS:

Participating to NoE “Patent-DfMM” (FP6 Project 2004-2008):

- Leader of the Reliability Workpackage and member of the Board of the NoE (2006-2008);
- Leader of 6 internal projects and participant to other 4 internal projects of the NoE;
- Member of the Board of EUMIREL - an association aimed to deliver services on microsystem reliability to European companies and research institutions.

Assessing the reliability of MEMS accelerometers manufactured by ST Microelectronics (Italy)

- Original method for reliability testing at mechanical and thermal stresses (tilting + temperature) – 2 Patent Demands (May 2007);
- The final report was presented to the Annual Review of the NoE Patent-DfMM, in March 2007;
- Paper in SENSORS (Dec.2007).

Robust designing and manufacturing of micro-biosensors for detecting the diuron based on inhibiting the photosynthesis process at cyanobacteria

- Functional micro-biosensor, tested by the customer;
- 2 Patent Demands (May 2007);
- Paper in Romanian J. of Information Science and Technology, 2006.

Memorandum of Understanding signed in June 2007 with the Reliability Centre of the Korean Institute KETI:

- 2 standards on reliability testing were elaborated in 2006-2007
- Reciprocal visits and talks for identifying possible joint projects

Close co-operation with the Centre for Microscopy – Microanalysis and Information Processing (CMMIP) of the University Politehnica Bucharest:

- Access to equipment on both sides
- Participation to joint projects (e.g. the network “Nanocrystalnet”, led by CMMIP and a CNCSIS grant on Nanoreliability, led by L7/IMT)

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