

L8: Laboratory for ambiental technologies

- **Mission**
- **Main areas of expertise**
- **Research Team**
- **Services offer**

Mission: • Developing new technologies in the areas of Microsystems technologies: technological design, technological simulation and technological development up to the prototype level;
• New materials development (i.e. nanocomposites);
• New assembly techniques for Microsystems (based on MCM);
• Technological services: technological assistance and consultancy (technological flows design, control gates, technological compatibilities) and defect analysis on technological flow;

Main areas of expertise: Design, simulation and develop individual technological processes for Microsystems technology (as piezoelectric integrated microsensors, high speed photodetectors and white LED micromatrix) and technological compatibilities MCM technologies and other nonstandard assembly technologies for Microsystems technological design.



Our team (from left to right): Andrei Ghiu, Maria Cimpoca, Veronica Schiopu, Alina Matei, Ileana Cernica, Florian Pistritu

Research Team: The team is represented by a senior researcher (PhD), a senior technological development engineer, 3 PhD students (with background in chemistry and mechanics) and a young engineer specialized in electronic applications field.

The team seniors have industrial experience and company RD activities in CMOS technologies (IC dice manufacturing and IC assembly techniques).

• **Services Offer:**

- Technological assistance for technological flow design, control gates and technological compatibilities
- Consultancy in technological compatibilities;
- Spectrometric characterization;
- Defect analysis on technological flow;
- Assembly techniques for MST;
- Dicing;

Example:

- FTIR Equipment for characterization.

Contact person: Veronica Schiopu

(veronica.schiopu@imt.ro);

- **UV-VIS Spectrometer** (AVANTES);

- **Rapid Thermal Processing RTP** (not installed);

Example of assembly

Contact person: **Ileana Cernica**

(ileana.cernica@imt.ro)



FTIR Equipment for characterization.

Laboratory Head — Dr. Ileana Cernica (ileana.cernica@imt.ro)



She received MSc. on Electronics and Telecommunication (1981) and PhD in Microelectronics (1998) both from University "POLITEHNICA" of Bucharest. She worked as senior integration engineer in CMOS IC's technologies, CMOS RD activities and as AQ responsible in the sole Romanian CMOS IC's industrial company for 10 years.

Now she is senior research scientist at National Institute for Research and Development in Microtechnologies, currently coordinates 5 national R&D projects and was responsible person in EUREKA Umbrella project MINATUSE and Romanian-German Centre for Micro and Nanotechnology Project.

She is project evaluator in national RD programs (CEEX, CNCSIS PNCDI II), IEEE and SPIE member and associate professor at University "Politehnica" of Bucharest (Faculty of Electronic, Telecommunication and Information Technology). Her scientific activity was published in more than 65 papers in international journals/conferences, 104 technical reports and is author or coauthor of 9 Romanian patents (2 of them won silver and 1 gold medals at International Inventions Exhibition in Brussels and Geneva) and 3 books.

WOOD - POLYMER COMPOSITE WITH COMPONENTS OF NANOSTRUCTURED MATERIALS AND NANOSENSORS FOR IMPROVEMENT OF INDOOR ENVIRONMENT

Main aim: Fabrication of walls (plates) of wood-polymer structure using wastes of wood processing and wastes type PET and plastic bags.

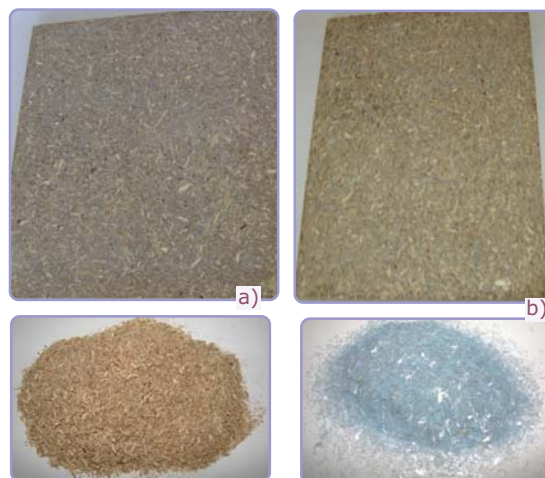
For "polymer - wood" plates has demonstrated the functionality from physical - mechanical properties for different experimental models which shown following aspects:

- The plates type as PAL - D (as chips disintegrated melamine PAL and new type of ureic resin) - have a thickness swelling after immersion in water more reduced (2,4% respectively 6,61%) against of stratified PAL (3,76% respectively 17,32%); water absorption (7,62% respectively 12,60% and 17,44% respectively 18,38%); resistance at statically bending much higher (23,79N/mm² against of 20,64N/mm²);
- The plated types PAL - PE with same adhesive type has thickness swelling with much reduced thickness as PAL classical stratified (3,0% against of 17,32%); water absorption (21,00% against of 18,38%); the resistance at static bending effort lower with 70%.

NANOPROTECT, PNCDII 2007-2010,
Coordinator IMT Bucharest.

Project manager: Ileana Cernica (ileana.cernica@imt.ro)

Partners: Partners: "Petru Poni" Institute of Macromolecular Chemistry - ICPAM Iasi; National Institute of Wood - INL Bucharest; INCDO-INOE2000, Research Institute for Analytical Instrumentation Cluj; S.C. NATURA SRL - Biertan, Sibiu; Transilvania University of Brasov;



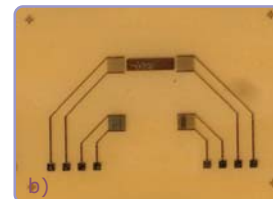
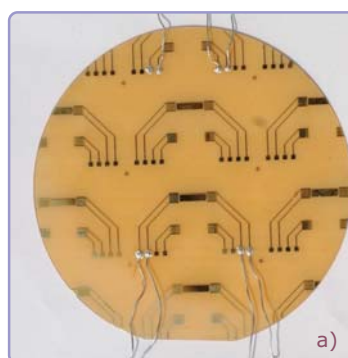
"Polymer-wood" plates of disintegrated wood type:
a) PAL-PE (polyethylene); b) PAL-PE-AM (maleic anhydride)

NEW TECHNOLOGIES FOR ACHIEVING MICROBIOSENSORS FOR REAL TIME DETECTING AND MONITORING TUBERCULOSIS IN GROUPS WITH INCREASED RISK POTENTIAL

Main aim: Main aim: a microbiosensor for TB manufactured on piezoelectric advanced material substrate

Achievements:

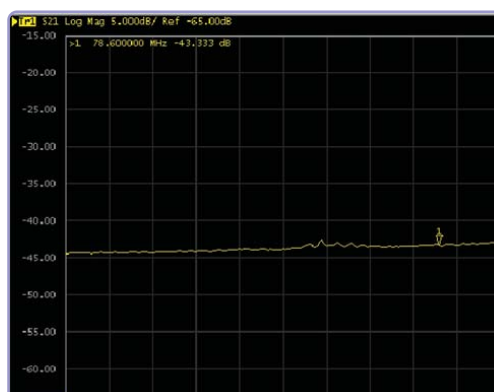
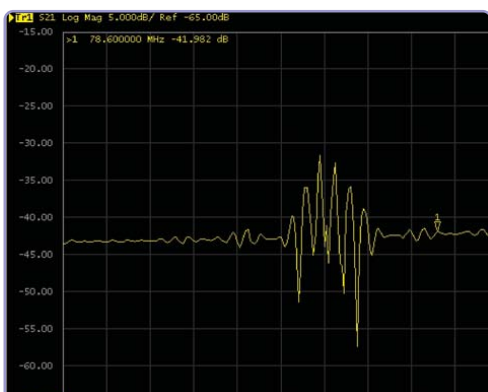
- Development a differential SAW piezoelectric microsensor with a lay-out designed to increase sensitivity and selectivity;
- Development some techniques of compatibilization between microsensor and sensitive substances;
- Processing of the tantalate and langasite substrates for the first time in Romania;
- Microsensors assembly using reusable support;



a) Sensor for detection of configured on langasite substrate; b) detail



Type of connectors proposed for sensors assembly



Sensor response in the absence and in the presence of bacillus

MICROBALERT, CEEX 2006-2008, Coordinator IMT Bucharest.

Project manager: Ileana Cernica (ileana.cernica@imt.ro).

Partners: ROMQUARTZ S.A.; PNEUMOTIZIOLOGY INSTITUTE MARIUS NASTA (IPMP); NATIONAL INSTITUTE FOR R&D IN ELECTROCHEMISTRY AND CONDENSED MATTER TIMISOARA (INCEMC); "POLITEHNICA" University of Bucharest (UPB-CCO); SITEX 45 SRL;