

Metrology for the Manufacturing of Thin Films

A new European Project on Optoelectronics

First Newsletter, February 2012

Edited by Fernando Araújo de Castro (NPL, UK) and Andreas Hertwig (BAM, Germany)

Welcome

ThinFilms is an EC and Euramet co-funded project of the European Metrology Research Programme (EMRP) with a focus on developing a pan-European metrology capability to provide validated and traceable metrology for thin film materials properties; for composition and structure; and for controlling large area homogeneity and consistency of properties.

The manufacturing of thin films is of key importance since it underpins a significant number of industries where Europe holds a leadership position. Of strategic importance for the EU are high value thin films used in the optoelectronics industry, such as plastic and printed electronics, displays and lighting, memories and solar cells.

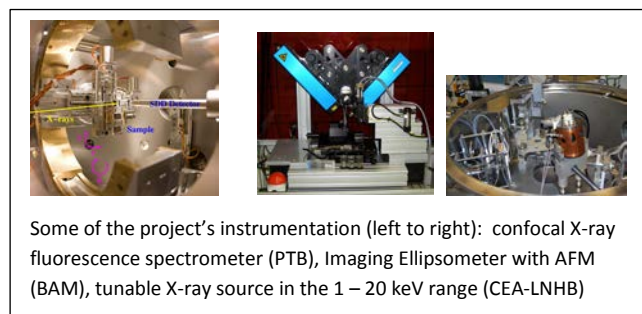
This project brings together a select group of Partners from national measurements institutes, designated institutes, industry and academia. This group will develop prototypes for advanced large area thin film characterisation, novel advanced microstructure characterisation tools and reference standards, and validated and traceable measurement setups that go beyond current state-of-the-art.

We hope that you will find this newsletter interesting and look forward to welcoming you as a member of the growing ThinFilms community!

Scope and Workpackages

The scientific work of this project is organised in three workpackages:

1. Validation and traceability of fundamental properties
2. Cutting-edge microstructure characterisation
3. Industrially relevant large area characterisation



The metrological problems of thin film production in several areas are investigated in a multi-scale approach: from microstructured samples to large area samples.

Within the three years, this project will carry out measurements going far beyond the state of the art for better characterisation of thin films, including e.g. film thickness, composition and homogeneity even on micro-structured surfaces, and thermophysical and electrical properties like heat conductivity and charge mobility.

The Participants



NPL, the National Physical Laboratory is the national measurement institute of the UK. NPL will participate with its long-standing experience in metrology for thin film organic electronics. The project coordination and management is located at NPL



PTB, the Physikalisch-Technische Bundesanstalt is the metrological institute of Germany. It will participate with two working groups, specialised on X-ray methods (fluorescence and reflectometry) and on infrared and Raman spectroscopy.



Aalto University

AALTO is the metrology institute of Finland. It will carry out optical reflectometry measurements on thin film systems in the course of this project.



BAM, the Federal Institute for Materials Research and Testing is a designated institute of Germany. Its surface technology division will produce coatings and carry out multi-scale ellipsometry measurements.



CEA-LNHB, the Alternative Energies and Atomic Energy Commission of France will participate in the project with their experience on absolute radiometry and X-ray spectrometry.



LNE, the Laboratoire National de Métrologie et d'Essais, will develop a traceable facility for thermophysical measurements on thin films .



CMI, the Czech Metrology Institute will contribute with work on nanometrology, SPM measurements and with their expertise on ellipsometry and reflectometry.



VSL, the National Metrology Institute of the Netherlands will build a new 0.5m x 1m scanning ellipsometer and use it to perform large area mapping of samples relevant for photovoltaics.



INMETRO, the National Metrology Institute of Brazil, will provide expertise on charge transport measurement in thin film organic devices.



PANalytical

PANalytical in the Netherlands is a leading supplier of spectroscopy equipment and will provide support with software and measurement equipment.



SOLARPRINT

SolarPrint in Ireland is a manufacturer of dye sensitised solar cell and will provide relevant samples and support for the project.



TOTAL

TOTAL Energy Development, part of TOTAL SA, in France is a developer of photovoltaic thin film technologies who will support the project and provide large area thin film samples.

REG and RMG partners

There are three Researcher Excellence Grants (REG) and one Research Mobility Grant (RMG) associated to this project:



REG (HZB), the Helmholtz Zentrum Berlin in Germany is a center of excellence for materials research who will provide sample development and measurement support at the BESSY II storage ring light source.



Fraunhofer

IISB

REG (IISB), the Fraunhofer Institute for Integrated Systems and Device Technology in Germany will provide fabrication and optical characterisation of thin films.



REG (Imperial College London), in the UK is participating with its Centre for Plastic Electronics and will provide samples and measurement support for a range of polymer-based electronic thin films.

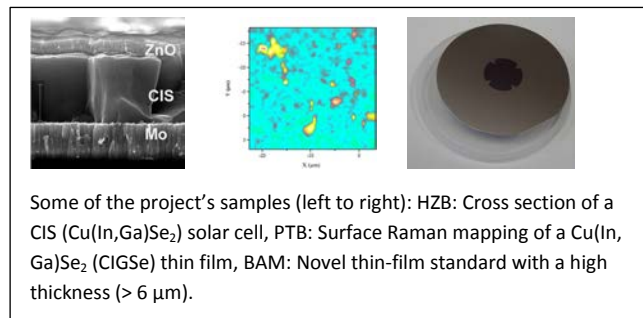


INSTITUTE OF PHYSICS

RMG (Institute of Physics), in Croatia is participating with expertise in modelling of charge mobility in organic thin film. The researcher will be based at NPL.

Early samples of our work

The following results have been produced in preparation of this project:



Where to meet us

- Workshop Ellipsometry, University Leipzig, March 5 – 7, 2012.
<http://polariton.exphysik.uni-leipzig.de/wse2012/>
- EMRS Spring Meeting, Strasbourg, France, May 14 – 18, 2012
<http://www.emrs-strasbourg.com>
- EMRS Fall Meeting, Warsaw, Poland, September 17 – 21
<http://www.emrs-strasbourg.com>

How to contact us

Project coordination and management:

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Project impact (publications, reports, newsletters)

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Project Website, Newsletter and list of links to the project's participants:

http://projects.npl.co.uk/optoelectronic_films/

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EMRP
European Metrology Research Programme
Programme of EURAMET

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EURAMET
European Association of National Metrology Institutes

