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Estrada Nacional 10, 2695-066 Bobadela LRS, Tel: +351 21 994 6000, Fax: +351 21 994 6016, www.ctn.tecnico.ulisboa.pt

CAMPUS TECNOLÓGICO E NUCLEAR

Data, hora, local/*Date, hour, local*: 22-03-2018, 11:00 - Auditório do CTN

Palestrante/*Speaker*: Günther Dollinger — Universität der Bundeswehr München, Germany

Título/*Title*: ***Materials analysis by high energy heavy ions, focused protons, and low energy positrons***

CURRICULUM VITAE

Günther Dollinger completed his doctoral studies in physics at the University of Technology Munich (TUM). He is currently head of the Institute of Applied Physics and Measurement Technology within the Faculty of aeronautical and aerospace engineering at Universität der Bundeswehr München. Günther Dollinger develops new microscopy methods for material analysis and biomedical research based on high energy protons and heavy ions as well as low energy positron beams.

ABSTRACT

The institute of applied physics and measurement technology develops and applies new materials analysis tools utilizing high energy heavy ion and proton beams at the Munich tandem accelerator and low energy positron beams from the intense positron source NEPOMUC at the research reactor FRM II situated in Garching next to Munich.

- I will exemplarily show the principles of high resolution elastic recoil detection as it is performed at a Q3D magnetic spectrograph. Beside a depth resolution better than 1 nm ERD is also suitable to analyse any light element in thin films with a ppm sensitivity and to quantify elemental contents with a relative uncertainty in the 1 % range at lower depth resolution.
- Utilising 13 MeV to 25 MeV proton beams focused to submicrometer diameter by the superconducting multipole lens at SNAKE we are able to perform hydrogen mapping. I will demonstrate the capabilities when analysing micrometer sized phases of a niobium film after hydrogen loading.
- Complementary information to the elemental depth profile analysis is obtained when analysing depth profiles of vacancy type defects by implanting positrons into materials at different energies. The positrons will annihilate at different depths telling defect sizes and their concentrations by their lifetime distributions.

Each of the methods will be demonstrated on selected examples of materials analysis.

Authors:
Günther Dollinger[1], Stephan Eschbaumer[1], Andreas Bergmaier[1], Patrick Reichart[1], Marcel Dickmann[2], Werner Egger[1],
[1] Applied physics and measurement technology, Universität der Bundeswehr München, Germany
[2] Heinz Maier-Leibnitz Zentrum (MLZ) and Physik Department E21, TU München, Garching, Germany