Séminaire du Triangle de la Physique

TRIANGLE DE LA PHYSIQUE

New advances in materials characterization using Synchrotron Radiation

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A review will be given of recently developed new tools for materials research, based on the use of high quality synchrotron radiation.

The first topic will concern High Kinetic Energy Electron spectroscopy. Using modern electron analysers a resolving power of about 100 000 at a kinetic energy of 10 keV is possible. As a consequence the field of electron spectroscopy on deeply buried interfaces has been opened and a few examples will be presented.

Another topic concerns the study of free clusters, using synchrotron radiation based core photoelectron spectroscopy. It is today possible to generate neutral cluster beams of all kinds of materials ranging from rare gases and molecules to metals. The density of clusters in the beams is sufficient to permit advanced spectroscopy, notably x-ray photoelectron spectroscopy, giving insight into the electron structure. This is an interesting line of research that opens up also the field of the surface physics of free nanoparticles. Several examples will be given.

The study of liquid beam surfaces, has recently been made possible at synchrotron radiation facilities. This research includes x-ray photoelectron spectroscopy and a large number of chemical applications are opened up.

Last but not least a short survey of future spectroscopic instrument developments will be made. There is an interesting development of of new advanced electron spectrometers for use at highly resolved pulsed sources of excitation. Very recent results from BESSY will be given in this part of the presentation.

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