II Mexican Workshop on Accelerator Physics: A Light Source

Monday 22 November 2010 - Wednesday 24 November 2010

Hotel Fiesta Americana, Puerto Vallarta, Mexico

Book of Abstracts

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General Overview of the Advanced Light Source: A soft x-ray/VUV facility

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In this talk, a general overview of the Advanced Light Source (ALS) will be presented. The ALS is a third generation light source optimized for soft x-ray/ VUV science. Beamline 10.0.1 of the ALS is a good example of a VUV/EUV beamline. A detailed description of this beamline will be presented. This high resolution beamline splits in three branches serving two very different communities. One branch is dedicated to photoemission studies of highly correlated materials (solid state physics) and the other two branches are dedicated to photoionization/photoexcitation studies of atomos, molecules and clusters in gas phase. Recent research highlights conducted in all three branches will be presented in a second talk.

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Recent Science Highlights at Beamline 10.0.1 of the Advanced Light Source

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Beamline 10.0.1 of the ALS has typically a dozen or so of groups per year. These produce an average of 25 refereed papers and 4 articles of high impact (PRL, Nature or Science) per year. The beamtime is equally divided for groups doing condense matter physics and groups from the atomic and molecular community. A selected group of recent science highlights from the research done at this beamline will be presented.

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Introduction to Synchrotron Radiation and Storage Ring Light Sources.

Dr. PODOBEDOV, Boris[1]

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Beam Dynamics in Storage Ring Light Sources.

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Accelerator physics, hardware, and operations at NSLS and NSLS-II.

Dr. PODOBEDOV, Boris[1]

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Light Source Design – Part 1: Parameters, Metrics and Configurations

Dr. HETTEL, Robert[1]

[1] *SLAC*

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Light Source Design – Part 2: Storage Ring Technology

Dr. HETTEL, Robert[1]

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Light Source Design – Part 3: Beam Stability Requirements

Dr. HETTEL, Robert[1]

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Setting up Simulations of Failure Scenarios for a Crab Cavity in the Nominal LHC.

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The Crab Cavity (CC) represent a possible solution for the problem of the reduction of the luminosity due to a crossing angle. The CC apply a transversal kick on the beam particles that varies with the longitudinal position along the bunch in order to produce a head-on collision and increase the geometry luminosity. For that reason the people of BE-ABP has been developed studies for the implementacion of the CC in the LHC.
Because the CC is a superconducting RF cavity is essential to study the failures scenarios and the damage that it could be generate to the lattice. So for that reason we set up the simulations of these failures of the CC in the nominal LHC.

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Stability Requirements: Buildings, thermal, electrical, Feed back, top-up, etc.

Dr. BORDAS, Joan[1]

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The ALBA project II

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The ALBA project

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Gas phase molecular physics experiments in synchrotron sources of second and third generatio

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This talk will present an overview of gasphase experiments of molecular and atomic photoionization from the the standpoint of a user. The studies presented are specifically devoted to the study of single and double photoionization processes as well as photoelectron angular distributions. In addition to a brief overview of the physical processes studied, this presentation will have a stronger focus on the requierements and needs, both in terms of flux and resolution, that these studies pose to experimental beamline where they are carried out. A comparison of performance of experiments carried out at a second generation source and a third generation source will be presented, taking the autovibrational processes in H2 as a concrete example.

Submitted Talks / 14

Production of Plastic Scintillator

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A new method for obtaining plastic scintillator will be presented. The material properties, such as the dopants used, as well as the optical and mechanical will be presented.

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Welcome, introduction and objectives of the II Mexican Workshop on Accelerator Physics

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An outline of the Mexican experiences on accelerators is given. The results of the first workshop are summarized and the aims of the present workshop, as perceived by the organizers, are put forward.

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Absorption and emission of soft x-rays to directly probe the Mott-Hubbard to charge transfer insulator transition in 3d transition metal compounds

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The description of the electronic structure of the transition metal compounds is complicated by the localization of the d orbitals. The first breakthrough came with Hubbard's proposal of a charge fluctuation model that included localized, correlated d orbitals and the possibility of electron hopping from one metal site to another. However, it was realized that in order to have an accurate understanding of some compounds it was necessary to include the possibility of charge transfer from the ligand to the metal site. This gave rise to the Zaanen-Sawatzky-Allen (ZSA) model for transition metal compounds. Experimental proof of this model is hampered because the traditional tools, photoemission and inverse photoemission, require experimental conditions (single crystals, ultrahigh vacuum) that are not always met. In this talk an alternative means to test the ZSA model using soft x-ray absorption and emission at both the transition metal L edge and the ligand K edge will be discussed. It is shown that the ligand K emission allows an unambiguous determination of the origin of the top of the metal band, and therefore of the nature of the electronic gap. This procedure is used to investigate the Mott-Hubbard to charge transfer transition of the transition metal difluorides (MF2, M= Cr - Zn). We found that, except for the filled Zn ion, all the top valence bands are predominantly metal 3d orbitals hybridized with fluorine 2p orbitals. Therefore, all compounds in this transition metal difluoride series are Mott-Hubbard insulators. By extrapolating our results we accurately reproduce the well known behavior of the transition metal monoxides. More examples dealing with transition metal ternary compounds will also be presented.

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Lecture on LNLS + Sirius (3GeV)

Prof. PETROFF, Yves[1]

[1] *LNLS*

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Why do we need Sirius? (Scientific examples)

Prof. PETROFF, Yves[1]

[1] *LNLS*

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Redes Científicas en México

Dr. DE LA PEÑA, José Antonio[1]

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Perspectives of a Light Source for Mexico

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Injection Systems for Synchrotron Light Sources

Dr. VOGEL, Hanspeter[1]

[1] *RI Research Instruments GmbH*

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RF Accelerating Systems for Synchrotron Light Sources

Dr. VOGEL, Hanspeter[1]

[1] *RI Research Instruments GmbH*

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Beamline Instrumentation: From Insertion Devices to Experimental Stations

Dr. VOGEL, Hanspeter[1]

[1] *RI Research Instruments GmbH*

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Using synchrotron radiation to describe protein catalytic mechanisms

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Protein crystallography has been the most successful technique for determining 3D structures from protein molecules. However, the technique has several disadvantages including the need of a crystalline sample, the unavoidable radiation damage and a static, averaged on time and space, resulting model. This is particularly relevant because it has been demonstrated that proteins are dynamic entities whose catalytic properties rely remarkably in their dynamic behavior. Several strategies (for example chemical and physical trap) have been developed in order to extract this dynamical information from protein crystals. We take advantage of the X-ray induced radiation damage to characterize intermediaries of the catalytic cycle from redox enzymes of the Multicopper Oxidase family.

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Luz de Sincrotrón para México, por qué sí.

Dr. HERRERA, Gerardo[1]

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