Monday, 09:10
Accelerator Projects at DESY
Reinhard Brinkmann, DESY

DESY is one of the worldwide leading accelerator laboratories. At present we operate the synchrotron radiation storage rings DORIS and PETRA-III and the superconducting linac soft X-ray free electron laser facility FLASH. DESY is a major partner for the construction of the European XFEL project and coordinator of the international consortium which builds the accelerator complex. In this talk, after a brief general introduction to the laboratory, an overview of DESY's activities in the area of accelerator operation, construction and R&D will be given.

Monday, 09:40
Electron beam diagnostics for X-ray-FEL's
Henrik Loos, SLAC

The performance of X-ray Free-electron lasers depends strongly on the achieved quality of the high brightness electron beam and its shot by shot stability. The requirements and challenges of the instrumentation needed to tune and optimize such electron beams will be discussed. Of particular interest are measurements of the beam orbit, emittance, energy, and bunch length and the different measurement techniques for these transverse and longitudinal beam parameters and their implementation for routine operation will be addressed in detail, particularly the necessary instrumentation to fulfill different user requirements in terms of beam energy and bunch length. Specific requirements for the initial commissioning, routine optimization and feedback applications will be presented as well.

Monday, 10:10
Photon diagnostics for X-Ray FEL´s
Michael Gensch, HZDR

SASE FEL´s have now truly evolved into the long anticipated so called 4^{th} generation of accelerator based X-ray light sources. A number of piloting experiments are proof that these novel X-ray sources provide radiation with the theoretically predicted unprecedented properties such as femtosecond pulse duration or Gigawatt peak power in a photon energy range extending from the soft X-ray into the hard X-ray regime. However, the success of these facilities depends strongly on the availability of suitable photon diagnostics. To be precise, due to the stochastic nature of the SASE process, properties such as pulse energy, wavelength, pulse duration and arrival time are varying from pulse to pulse and more complex experiments will crucially depend on the determination of these properties for every individual X-ray pulse. In this talk, the state of the art of currently available photon diagnostic is discussed and novel single shot techniques for the measurement of X-ray pulse duration [1] and arrival time [2] are presented.

Monday, 14:30
Overview of Recent Trends and Developments for BPM Systems
Manfred Wendt, FERMILAB

Beam position monitoring (BPM) systems are the workhorse beam diagnostics for almost any kind of charged particle accelerator; linear, circular or transport-lines, operating with leptons, hadrons or heavy ions.The BPMs are essential for beam commissioning, accelerator fault analysis and trouble shooting, machine optics and lattice measurements, and finally for the accelerator optimization to achieve the ultimate beam quality.

This presentation summarizes the efforts of the beam instrumentation community on recent developments and advances on BPM technologies, i.e. BPM pickup monitors and front-end electronics (analog and digital). Principles, examples, and state-of-the-art status on various BPM techniques are outlined, serving hadron and heavy ion machines, sync light synchrotron's, as well as electron linacs for FEL or HEP applications.

Tuesday, 09:00
Beam instrumentation in J-PARC
Takashi Toyama, KEK

The talk will summarize the beam instrumentation at J-PARC with a focus on MW class proton beams. The measurements of beam intensities, positions, losses, profiles, and halos at each stage of accelerator, 181 MeV LINAC (to be upgraded to 400MeV), 3 GeV RCS and 50 (30 as phase I) GeV MR will be reported. Present status, including modification and improvement of instrumentations to meet with LINAC energy upgrade and a future plan will be reported with emphasis on high beam power related issues such as radiation hardness (mechanically and electrically), beam coupling impedance, etc..

Tuesday, 11:20
Options for next generation digital acquisition systems
Andrea Boccardi, CERN

Digital acquisition system designers have an always increasing number of options in terms of bus standards and digital signal processing hardware among which to choose. This allows for a high flexibility but also open the door to a proliferation of different architectures, potentially limiting the reusability and the design synergies among the various instrumentation groups. This contribution illustrates the design trends in some of the major institutes around the world with design examples including VME, PCI and uTCA based modular systems using AMC and/or FMC mezzanines. Some examples of FPGA design practices aimed to increase reusability of code will be mentioned together with some of the tools already available to designers to improve the information exchange and the collaboration, like the Open Hardware Repository project.

Tuesday, 11:50
Designing Electronics for use in Radiation Environments
Christos Zamantzas, CERN

In this talk, an overview will be provided on the necessary steps a new project will need to take to ensure the requirements in terms of resilience to the dose accumulated and single event effects. Information will be given on the different design options and the available tools designers can employ to augment the tolerance of the system as well as the techniques developed to mitigate the problems that can arise in radiation environments. It will be also shown how the knowledge of the expected fluence and flux, together with the given specifications will dictate the conceptual design, the component choices limited to use, and the required validation and quality assurance through irradiation testing that will be necessary to be undertaken.

Tuesday, 14:30
Highlights from BIW 2010
Doug Gilpatrick, LANL

The 14th Beam Instrumentation Workshop (BIW10) was hosted by the Los Alamos National Laboratory and was held in the La Fonda Hotel in downtown Santa Fe, NM, USA from May 3 - 6, 2010. At BIW10, there were a record amount of participants including 177 registered attendees, 92 poster presentations, and 22 companies represented. The oral presentations included 3 tutorials, 8 invited, 10 contributed, a Faraday Cup Award, 2 Vendor Technical, and 1 Special. This oral presentation provides an overview of beam instrumentation areas of interest, which were discussed during the workshop. From a selection of the BIW10 presented papers, a number of technical highlights will also be described. Finally, this oral presentation will briefly discuss the BIW10 Thursday afternoon tour that took place at the Los Alamos Neutron Science Center.

Wednesday, 09:00
Summary of COTR effects
Stephan Wesch, DESY

Optical transition radiation (OTR) is a standard diagnostic tool for determining the transverse size and emittance of GeV electron beams. For the very intense and tightly collimated electron bunches used in high-gain free-electron lasers coherent optical radiation has been observed which may become so strong that OTR-based beam diagnostics becomes obsolete. This talk presents results on COTR effects at LCLS and FLASH and their dependence on beam and machine parameters. The theoretical background as well as possible cures will be discussed.

Wednesday, 11:20
A Review of Screen Monitors
Beata Walasek-Höhne, GSI

Scintillation screens are widely used for transverse beam profile diagnostics at particle accelerators. The monitor principle relies on the fact that a charged particle crossing the screen material will deposit a part of its energy which is converted to visible light. The resulting light spot is a direct image of the two-dimensional beam distribution and can be measured with standard optical techniques. Scintillating screen monitors were mainly deployed in hadron and low energy electron machines where the intensity of optical transition radiation (OTR) is rather low. The experience from modern linac based light sources showed that OTR diagnostics might fail even for high energetic electron beams, thus making the use of scintillators again very attractive. This contribution summarizes results and trends from "Scintillating Screen Applications in Beam Diagnostics" workshop recently held in Darmstadt. In the first part an introduction to the scintillation mechanism will be given, including demands and limitations as e.g. the dynamic range and saturation. Thereafter a brief overview on actual screen monitor applications at electron and hadron accelerators will be presented.

Wednesday, 14:30
Beam Charge Measurements
David Belohrad, CERN

The measurement of beam charge is fundamental to all particle accelerators. There exist many methods to achieve this, which can broadly be classified into two categories: intercepting measurements, which are destructive for the beam and result in absorption of a significant amount of energy; non-intercepting measurements using electric or magnetic field coupling. In both categories one can find instruments that process the beam signals with high dynamic range, both in amplitude and time. The aim of this article is to present the current state of beam charge measurement technology. Various measurement methods will be described with their uses, advantages, and achievable resolution and accuracy discussed. The technological problems related to their fabrication will also be addressed.

Wednesday, 16:30
Beam Induced Fluorescence Monitors
Frank Becker, GSI

Non-intersecting diagnostic devices in hadron accelerators offer continuous online monitoring capability. They also avoid the problem of potential thermal damage in high-current applications. Taking advantage of the residual gas as active material, the Beam Induced Fluorescence (BIF) monitor exploits gas fluorescence in the visible range for transversal profile measurements. Depending on beam parameters and vacuum-constraints, BIF monitors can be operated at base-pressure or in dedicated local pressure bumps up to the mbar range. Nowadays, BIF monitors are investigated in many accelerator laboratories for hadron energies from about 100 keV up to several 100 GeV. This talk gives an introduction to the measurement principle and typical operating conditions. It summarises recent investigations, e.g. on different working gases, and it compares various technical realisations.

Wednesday, 17:00
LHC beam diagnostics - the user´s view
Jörg Wenninger, CERN

The LHC started up with beam in November 2009, and within less than on year its luminosity reached 2E32 cm-2s-1 at 3.5 TeV in October 2010. A few weeks later, in November 2010, lead ion collisions were established within little over 2 days. The fast progress and successes of the LHC commissioning and early operation would not have been possible without the excellent performance of its beam instrumentation. All essential instruments worked from the first day or were commissioned in a very short time, providing rapid diagnostics for the beam parameters. Tune and orbit feedbacks that rely on high quality measurements were used early on to achieve smooth operation with minimal beam losses. This presentation will address the performance of the LHC beam instrumentation, in particular the very large beam position and beam loss monitoring systems, both composed of many thousand channels. Present limitations and future improvements will also be discussed.