ORAL CONTRIBUTIONS IWBS2004_orals_pdf IWBS2004_orals_compact_pdf

Oral Contributions by Session

#	First Name	Last Name	Institution	Country	List To
02	Rene	Bakker	PSI	Switzerland	List
Oral Presentation #1:					
Session: Stability Requirements in 4th Generation Light Sources					
Title #1: FEL2004 - Beam Stability Issues at FELs					
Abstract: A report on beam stability issues which have been covered at the 26th International Free Electron Laser Conference held in Trieste, Italy is given. Different FEL designs are discussed followed by a comparison of their stability requirements.					
Transparencies: PDF CompactPDF PPT NoSXI					

#	First Name	Last Name	Institution	Country	List To
03	Klaus	Balewski	DESY	Germany	List
Oral Presentation #1:					
Session: Facility Reports					
Title #1: Conceptual Design of the PETRA III Orbit Feedback					
Abstract: DESY has decided to rebuild its 2304 m long accelerator PETRA II into a dedicated light source called PETRA III. The new light source will operate at an energy of 6 GeV a current of 100 mA a horizontal emittance of 1 nmrad and an emittance coupling of 1%. To obtain and maintain the small emittances imposes tight tolerances on spurious dispersion and orbit quality and stability. A fast orbit feedback is necessary to achieve the required orbit stability. The conceptual layout and the basic design parameters of the system will be given in this talk.					
Transparencies: PDF CompactPDF PPT NoSXI					

#	First Name	Last Name	Institution	Country	List To
05	Julien	Bergoz	Bergoz Instrumentation	France	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Latest developments and whats to come in beam position measurement

Abstract: New developments not yet announced will be presented with prototypes performance where available. Our current R&D program will be presented and new products to expect in the next 24 months.

Transparencies: PDF CompactPDF PPT NoSXI

#	First Name	Last Name	Institution	Country	List To
06	Michael	Böge	Paul Scherrer Institut	Switzerland	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Orbit Stability at the SLS

Abstract: Top-up operation has proven to be an important prerequisite for high orbit and energy stability at the SLS. The fast global orbit feedback running in user operation since ~1 year ensures a complete decoupling of the insertion device operation up to 100 Hz. Slow (<1Hz) X-BPM feedbacks running as an integral part of the fast global orbit feedback system following a cascased feedback scheme guarantee sub-micron stability of the photon beam positions. Several incidents related to the malfunctioning of the SLS cooling system have demonstrated how difficult it is to maintain the same high level of stability over weeks or even months if the operating conditions of the accelerator and the beamlines cannot be kept constant.

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#	First Name	Last Name	Institution	Country	List To
08	Daniele	Bulfone	Sincrotrone Trieste	Italy	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Orbit Stability: Recent Activities at ELETTRA

Abstract: A review is given of the most recent activities aimed at improving orbit control and stability at ELETTRA. In view of a fast global orbit feedback two local feedback systems that correct the position and angle of the electron beam at the center of the ID have been installed and are in routine operation. The fast local feedback systems and their performance are presented.

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#	First Name	Last Name	Institution	Country	List To
09	Glenn	Decker	Advanced Photon Source	United States of America	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Orbit Stabilization at the Advanced Photon Source

Abstract: An overview of DC and AC orbit correction systems presently in use at the Advanced Photon Source will be given. This includes broadband and narrowband rf beam position monitors bending magnet and insertion device photon beam position monitors data acquisition and distribution infrastructure steering corrector magnet power supply interfaces system configuration control signal processing algorithms and the practical implementation of singular value decomposition for concurrently running DC and AC orbit correction.

Transparencies: PDF CompactPDF NoPPT NoSXI

Oral Presentation #2:

Session: Orbit Measurement/Correction

Title #2: Experience with Insertion Device Photon Beam Position Monitor at the APS

Abstract: Following a seven-year-long effort to realign the APS storage ring in order to reduce stray radiation from the field of view of the insertion device photon beam position monitors their inclusion in DC orbit correction has made possible long term (> 48 hours) stabilization of insertion device x-ray beams to better than 500 nanoradians p-p. Compensation of residual insertion device gap-dependent systematic errors has been critical in this effort. The history of this effort and recent results will be presented.

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#	First Name	Last Name	Institution	Country	List To
10	Winfried	Decking	DESY	Germany	List

Oral Presentation #1:

Session: Stability Requirements in 4th Generation Light Sources

Title #1: Beam Stability Issues at the European XFEL

Abstract: The European XFEL will provide users with x-ray radiation of unique properties in terms of brightness time structure and coherence. Beam stabiltiy issues arise both from user demands and form the stability of the SASE-FEL process itself. This issues will be reviewed and compared with achievements in 3rd generation light sources.

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#	First Name	Last Name	Institution	Country	List To
11	Hans	Duhme	Desy	Germany	List

Oral Presentation #1:

Session: Stability Requirements in 4th Generation Light Sources

Title #1: DESIGN AND TEST OF A FAST FEEDBACKSYSTEM FOR ORBIT CORRECTION AT TTF AND VUV-FEL

Abstract: To achieve self-amplified spontaneous emission (SASE) for the VUV-FEL at DESY high orbit stability is required. Feedback systems will be needed to provide orbit corrections within the bunch train. A prototype of the complete vertical feedback system has been installed in the TESLA Test Facility at DESY. The use of digital signal processing techniques led to a fast and highly flexible solution for the controller function. Additional features such as data logging and analysis allow easy adjustment of the feedback parameters to achieve the optimum performance of the system. An overview of the system will be presented as well as the results of first measurements.

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#	First Name	Last Name	Institution	Country	List To
12	Marc	Grewe	DELTA Universität Dortmund	Germany	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Orbit Correction under Constraints

Abstract: Orbit correction for a misaligned magnet lattice or certain orbit demands accompanied by little phase advance may request orbit correctors to exceed their physical limits. A flexible concept is presented to treat such situations while obtaining the best result possible.

Transparencies: PDF CompactPDF PPT NoSXI

#	First Name	Last Name	Institution	Country	List To
13	Hirofumi	Hanaki	JASRI/SPring-8	Japan	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Beam Stabilization in the SPring-8 Linac

Abstract: The SPring-8 storage ring has requested the injection of stable beams to realize a uniform bunch pattern in the stored beam and highly stabilized stored cuurent for the top-up operation. Now the SPring-8 injector linac has achieved the beam energy stability of 0.01% (rms). The beam stability of the SPring-8 linac has been improved by means of reducing RF variations providing beam energy compensation and introduction of beam trajectory feedback control: Variations in the RF power and phase have been reduced by improving the voltage regulation system for the klystron modulator and by stabilizing the temperature drift of the atmosphere and cooling water in order to reduce the phase variation. A new synchronous oscillator synchronizes a beam trigger pulse and a 2856 MHz reference signal. Variation in the beam charge was reduced by this synchronizing technique; the stabilized beam loading consequently resulted in the beam energy fluctuation of 0.01% rms. A beam energy compression system (ECS) was installed to compensate for accidental energy variation and reduce the energy spread due to beam loading. The reduced energy spread enabled the high-current injection without increasing beam loss. The feedback control of steering magnets compensates long-term variations of the beam trajectory at the end of the beam transport line.

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#	First Name	Last Name	Institution	Country	List To
15	Kuotung	Hsu	National Synchrotron Radiation Research Center NSRRC	Taiwan	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Orbit Stabilization at Taiwan Light Source

Abstract: Highly orbit stability is essential to satisfied user requirements in Taiwan Light Source. Various efforts were done during last decade and orbit stability is also improved drastically. These efforts will be overviewed in this report. Activity of orbit feedback system and preparation for top-up operation will be addressed. Briefing of the facility status will be included.

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#	First Name	Last Name	Institution	Country	List To
17	Heung-Sik	Kang	Pohang Accelerator Laboratory	South Korea	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: SLOW GLOBAL ORBIT FEEDBACK AT THE PLS

Abstract: A slow global orbit feedback was developed at PLS. The feedback uses the SVD (singular value decomposition) method and the MATLAB channel access to EPICS IOCs of BPMs and correctors and the feedback speed is 4 seconds. The orbit feedback uses 22 correctors in each plane which were improved to 20-bit capability in the vertical plane and 16-bit capability in the horizontal plane. The orbit stability can be maintained below 1 micro-meter in rms in both planes for one hour and 3 micro-meter for a 12-hour operation. To reduce the orbit variation due to insertion device operation a feedforward correction is incorporated for EPU (Elliptically Polarized Undulator) with a 10 Hz correction speed. It is found that the long term orbit variation is due to the false BPM reading coming from the Bergoz BPMs nonlinear intensity dependence and the vacuum chamber motion by synchrotron radiation thermal load change.

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#	First Name	Last Name	Institution	Country	List To
19	Boris	Keil	Paul Scherrer Institut	Switzerland	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: The "Generic VME PMC Carrier Board": Status and Perspectives of a Common Digital Platform for Beam Diagnostics and Feedbacks at PSI

Abstract: The "generic VME PMC Carrier board" (VPC) was developed as a common digital hardware platform for beam diagnostics and feedback systems at PSI. The core of the board consists of two Virtex2Pro FPGAs with two on-chip PPC processors each a Sharc DSP and RAM. Customized analog frontend modules for the different applications of the VPC board can be interfaced to the board via two PMC mezzanine connectors or VMEbus P0/P2 backplane connectors. The multi-gigabit fiber optic transceivers of the VPC allow the acquisition and distribution of measurement data for fast global feedbacks. An overview of present and possible future applications of the VPC board will be given such as digital BPMs (DBPMs) for the PSI proton accelerators integration of X-ray BPMs in the SLS fast orbit feedback (FOFB) and upgrade options to replace the existing SLS DBPM/FOFB system with a VPC based platform.

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#	First Name	Last Name	Institution	Country	List To
22	Lin	Liu	LNLS-Brazilian National Laboratory for Synchrotron Light	Brazil	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Orbit Stability at the Brazilian Synchrotron Light Source

Abstract: A task force has been implemented at the Brazilian Synchrotron Light Laboratory to improve the beam orbit stability in the 1.37 GeV electron storage ring. The main problems faced during this year (2004) were due to the installation of a second RF cavity in the machine. The interaction of the new cavity with the beam caused longitudinal dipole oscillations which appeared as a horizontal orbit distortion proportional to the second order dispersion function. To suppress this instability we have applied a phase modulation on the rf accelerating voltage. Other critical problem involves BPM readings which seems to be affected by the increased electromagnetic noise in the hall. A careful design for a shielding box for the electronics has been made and those are under construction.

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#	First Name	Last Name	Institution	Country	List To
24	Ian	Martin	Diamond Light Source	United Kingdom	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Beam Orbit Stabilisation at Diamond Light Source

Abstract: Diamond Light Source is the 3rd generation 3 GeV electron synchrotron currently under construction in the UK. In order to meet the photon beam brightness and stability requirements of the user community strong restrictions are placed on the allowable motion of the electron beam. This talk will present the various active and passive measures that have been taken at Diamond Light Source in order to suppress orbit motion on both long and short timescales.

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#	First Name	Last Name	Institution	Country	List To
26	Roland	Müller	BESSY	Germany	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Orbit Stability at BESSY

Abstract: Traditionally intrinsic component stability as well as perturbation source identification and suppression (like set-up modifications or feed-forward compensations) have been the preferred methods used to guarantee beam orbit stability for user operation at BESSY. Second focus of activity is the reliability of slow drift control and the high degree of beam position reproducibility maintained under frequently changed operation conditions. Along these lines improvements as well as understanding of shortcomings have been achieved since IWBS02. In addition the need for a fast orbit feedback system has become obvious due to the constant introduction of ever new noise sources as well as the requests for new demanding operation modes. As a first step a fast BPM read-out and data distribution system has been set up. Pilot experiments with this system as well as usage of the diagnostic capabilities provide us with valuable experiences.

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#	First Name	Last Name	Institution	Country	List To
27	Anke-Susanne	Mueller	FZ Karlsruhe - ANKA	Germany	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Energy Calibration and Stability of the ANKA Storage Ring

Abstract: ANKA is a synchrotron light source located at Forschungszentrum Karlsruhe Germany. In the course of daily operation the storage ring is ramped from the injection energy at 0.5 GeV to the final energy of 2.5 GeV. This causes thermally induced drifts in the bending field and therefore drifts of the beam energy following the ramp. The resulting orbit drifts have to be compensated by an automatic orbit correction program.To this ends the orbit correction algorithm changes the RF frequency to match the frequency for central quadrupole passage thereby changing the beam energy back to nominal. The accuracy of this procedure as well as its reproducibility have been checked using the method of resonant depolarisation. Longterm data logging gives the opportunity to study external influence like outside temperature. This presentation gives an overview over the studies performed at ANKA.

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#	First Name	Last Name	Institution	Country	List To
28	Marc	Munoz	CELLS-ALBA	Spain	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Report on Stability Issues at ALBA

Abstract: A short description of the measurements carried on the proposed site for ALBA is presented including a short description of the facility the vibration measurements and the geotechnicals studies.

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#	First Name	Last Name	Institution	Country	List To
29	Amor	Nadji	Synchrotron SOLEIL	France	List

Oral Presentation #1:

Session: Facility Reports

Title #1: STATUS REPORT ON BEAM POSITION STABILITY STUDIES AT SOLEIL

Abstract: The progress on the design to reach the best beam position stability since the last IWBS02 workshop will be summarized. The slabs of the storage ring and the experimental hall are completed. Measurements have been carried out on a long magnet-girder assembly prototype in order to check and validate the static and dynamic behaviour predicted by simulation. Measurements are being performed on a prototype of the Hydrostatic Levelling System foreseen for monitoring the vertical position long term drifts. The air-conditioning system in the storage ring tunnel has been studied with the temperature regulation criteria of 21°C ± 0.1°C and the number of air-conditioning units and their locations have been optimised. The results on the BPM electronics prototype (LIBERA module) as well as the progress on the design of the fast orbit feedback and its interaction with the slow one will also be reported.

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#	First Name	Last Name	Institution	Country	List To
30	Norio	Nakamura	ISSP University of Tokyo	Japan	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Activities on the Orbit Feedback System for the Super-SOR Light Source

Abstract: Activities on the orbit feedback system for the Super-SOR project are overviewed. Design and R&D of the feedback components and subsystems such as BPM fast steering and control systems are presented. A new orbit correction method eigenvector method with constraints is introduced as an orbit correction scheme of the feedback system to unite global and local feedbacks and the result of the computer simulation for the Super-SOR ring and the experimental studies using the PF and PF-AR rings are reported. The Super-SOR project that aims at constructing a therd-generation VUV and soft X-ray synchrotron radiation source in Japan is also mentioned.

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#	First Name	Last Name	Institution	Country	List To
31	Frithjof	Nolting	Paul Scherrer Institut	Switzerland	List

Oral Presentation #1:

Session: User Experience

Title #1: A users viewpoint: absorption spectroscopy at a synchrotron

Abstract: X-ray absorption spectroscopy is a powerful tool for the investigation of surfaces and interfaces. Combined with polarization control it is ideal suited for the investigation of magnetic multilayer systems. The measurements require a frequent moving of gap and shift of the insertion devices. Combined with the aim of measuring small signals this puts great demands on the insertion devices and the orbit stability. In this presentation examples of the X11MA beamline at the SLS are shown and the effect of fast and slow orbit feedback is shown.

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#	First Name	Last Name	Institution	Country	List To
32	Takashi	Obina	Photon Factory KEK	Japan	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Recent development in orbit stability and the feedback system at KEK Photon Factory and PF Advanced Ring

Abstract: In KEK Photon Factory a test undulator to enable a swiching of the circular polarized X-ray was installed and the effect on the beam orbit was tested. We introduced a feedback system to suppress the orbit fluctuations due to the mechanical motion of the magnet arrays. In PF-AR new injection system using a pulsed quadrupole magnet was installed. Because the stored beam was not affected by this magnet we plan to use them for the top-up operation of the Photon Factory. The preliminary result with beam will be reported.

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#	First Name	Last Name	Institution	Country	List To
33	Takashi	Ohshima	JASRI/SPring-8	Japan	List

Oral Presentation #1:

Session: Noise Source Suppression

Title #1: Feedforward correction to injection bump error in the Spring-8

Abstract: Feedforward corrections for horizontal and vertical direction to compensate the injection bump error are applied at SPring-8. Two pulse magnets are used for this purpose. The power supplies for these magnets are required high output current with fast rise time. We will present details on measurement of error kicks corrector magnets and their power supplies.

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#	First Name	Last Name	Institution	Country	List To
34	Eric	Plouviez	ESRF	France	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Fast orbit correction at the ESRF

Abstract: The suppression of the fast orbit distortions was a concern at ESRF since the beginnig of the operation. Tools implemented to reduce these distortions include fast local and global orbit feedbacks installation of vibration damping pads on the magnet girders and feedforward corrections in function of the insertion device operation. A sum up of the evolution of the orbit stability achieved over the years thanks to the implementation of these systems will be given. The last addition to this scheme is the recent upgrade of the fast global orbit feedback. We are now able to correct both the horizontal and vertical orbit in the .1 to 200 Hz range using 32 BPMs and 24 correctors in both planes. Results obtained using this new system will be presented.

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#	First Name	Last Name	Institution	Country	List To
35	Guenther	Rehm	Diamond Light Source	United Kingdom	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: EBPMs and orbit feedback electronics at Diamond

Abstract: An overview of the capabilities of the electron beam position system for Diamond is given. The planned technical solutions for the synchronisation data transport and feedback calculations will be detailed. Also the strategy of software development for the implementation will be outlined.

Transparencies: PDF CompactPDF PPT NoSXI

#	First Name	Last Name	Institution	Country	List To
37	Thomas	Schilcher	Paul Scherrer Institut	Switzerland	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Fast Orbit Feedback Operation at the SLS

Abstract: A global fast orbit feedback system (FOFB) is in operation at the SLS since November 2003. It provides sub-micrometer elctron beam stability in a frequency range from 0.1 Hz - 100 Hz. In addition a slow high level feedback has been implemented at some beamlines to stabilize the photon beam at the location of their first optical elements. The performance and experiences of the FOFB will be presented as well as future upgrade and improvement plans.

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#	First Name	Last Name	Institution	Country	List To
38	Volker	Schlott	PSI	Switzerland	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Report on the internal "SLS mini-workshop on beam stability"

Abstract: An internal mini-workshop on beam stability was held at SLS in September 2004. It was intended to review the performance and limitations of the actual HW installations and the applied orbit correction schemes from the perspective of present and future user and operational requirements. A short summary on the main aspects will be presented including operational experience with the fast orbit feedback (FOFB) present and future user requirements as well as the status of HW installations such as digital RF BPMs photon BPMs and alignment systems.

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#	First Name	Last Name	Institution	Country	List To
39	Clemens	Schulze-Briese	Swiss Light Source at PSI	Switzerland	List

Oral Presentation #1:

Session: User Experience

Title #1: Stable beam and good data - Experience with beam (in-) stability at the SLS protein crystallography beamline X06SA

Abstract: Besides the low divergence of undulator beams beam stability is one of the most essential advantages of 3rd generation synchrotron sources over previous sources for protein crystallography. This is due to the trend to use crystals that previously would have been discarded as being too small for data collection because the beam intensity and size allow for it. Consequently small absolute beam position changes result in significant changes of the diffracted intensities. In the presentation different parameters and their influence on data quality will be discussed and they will also be compared to intrinsic sources of noise of the experiment.

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#	First Name	Last Name	Institution	Country	List To
40	Christoph	Steier	Lawrence Berkeley National Laboratory	United States of America	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Recent progress at the ALS: Fast Orbit Feedback and Preparation for Top-Off

Abstract: The main improvement of the orbit stability at the ALS during the last year was achieved by the introduction of a fast global orbit feedback system for routine user operation. With this sytem the short term vertical orbit stability at the ALS is now in the submicron range. In addition many studies were performed together with beamline users to evaluate transients due to injection elements and minimize their amplitude in preparation for top-off. Currently the project to upgrade the injector for full energy injection and modify the radiation protection systems for top-off are under way.

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#	First Name	Last Name	Institution	Country	List To
41	Ralph	Steinhagen	CERN	Switzerland	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Large Scale Orbit Correction for the LHC

Abstract: The LHC presently build at CERN is the first hadron collider that requires an orbit feedback control for safe and reliable machine operation. The feedback system consist of 1056 BPMs and 1060 CODs that cover the 27 km circumference. The present design uses a SVD based global orbit correction scheme and PID controller with Smith-Predictor extension. The central controller is implemented as a x86 based server that is connected to the BPM and COD front-ends using Gigabit Ethernet. Latencies of the network interfaces and the numerical complexity of the steering task in the central feedback controller are the identified bottlenecks of the system and controlled though network quality of service (QoS) and task scheduling. A complementary test bed has been developed that simulates the open-loop and orbit response in order to test and verify controller implementation and new control strategies.

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#	First Name	Last Name	Institution	Country	List To
42	Till	Straumann	SLAC/SSRL	United States of America	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Fast Orbit Feedback Electronics for SPEAR3

Abstract: SPEAR-3 has provisions for a orbit stabilizing feedback running at a clock rate of 4kHz. BPM data is shipped to a central processor using commercial ethernet cards in a dedicated point-to point network. The same technology is used to push corrector settings out to the power-supply controllers. A simple timing system is used for global synchronization and event distribution.

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#	First Name	Last Name	Institution	Country	List To
43	Andreas	Streun	PSI	Switzerland	List

Oral Presentation #1:

Session: Noise Source Suppression

Title #1: Dynamic Alignment

Abstract: The concept of dynamic alignment adds sensoric and motoric capabilities to the lattice structure in order to monitor and correct the magnet and BPM positions during operation. Dynamic alignment may include movable magnet girders and a hydrostatic levelling system as well as digital sensor systems for measurements of horizontal girder positions and BPM locations relative to girders. The potentials and problems of dynamic alignment will be discussed in general and the experiences in passive (monitoring) and active (on-line realignment) mode at SLS and other facilities will be reviewed.

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#	First Name	Last Name	Institution	Country	List To
44	Hitoshi	Tanaka	JASRI/SPring-8	Japan	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Present Status of Orbit Stability at SPring-8

Abstract: We have started so called "top-up operation" at SPring-8 since May this year. It is well known that this operation keeps the thermal equilibrium of vacuum chambers the inside atmosphere of the tunnel and X-ray beam optics. However due to the peculiar condition of SPring-8 the drastic improvement has not seen on beam orbit stability. On the other hand the top-up oeration reveals a new perturbation source which was burried in the noisy variation during the original non-top-up operation. We will be reporting the present status of the SPring-8 orbit stability especially focusing on the problems we are now facing to.

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Oral Presentation #2:

Session: Noise Source Suppression

Title #2: New Approach to Correction of COD Caused by ID parameter Change

Abstract: We have developed a scheme for precisely correcting orbit variation caused by a dipole error-field of an insertion device (ID). For the precise correction extraction of a real response i.e. beam orbit variation by a change of the ID error-field is the key. To this end over a measurement period changeable parameters during an experiment a gap and a phase of ID are periodically changed with a mirror symmetric pattern. This operation modulates the real response measured by a couple of conventional wide frequency-band detectors. The real response is thus extracted precisely by adequate averaging and filtering procedures. Furthermore the mirror symmetric pattern enables us to separately extract the orbit variation by a static error field and that by a dynamic one e.g. an induced field by the dynamical change of the ID gap or phase. We built a real time measurement system with a sampling rate of 100Hz and applied the scheme to correct the orbit variation caused by the error-field of an APPLEII type undulator installed in the SPring-8 storage ring. The obtained result shows that the developed scheme markedly improves the correction performance and can suppress the orbit variation by the ID error-field down to the level of one micron.

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#	First Name	Last Name	Institution	Country	List To
45	Rok	Ursic	Instrumentation Technologies	Slovenia	List

Oral Presentation #1:

Session: Orbit Measurement/Correction

Title #1: Libera Electron Beam Position Processor

Abstract: Libera electron beam position processor offers unprecedented performance offering multiple measurement channels that delivering simultaneously position measurements in digital format with MHz kHz and Hz bandwidths. This all-in-one product is much more than simply a high performance beam position measuring device delivering submicron stability. Rich connectivity options and innate processing power make it a powerful feedback building block. By interconnecting multiple Libera electron beam position processors one can build a low-latency high throughput orbit feedback system without adding additional hardware. It is ideally suited for the Third and the Fourth generation light sources.

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#	First Name	Last Name	Institution	Country	List To
47	Jorg	Wenninger	CERN	Switzerland	List

Oral Presentation #1:

Session: Facility Reports

Title #1: Orbit Stabilization at the Large Hadron Collider

Abstract: The Large Hadron Collider (LHC) under construction at CERN uses superconducting magnets to accelerate two high intensity proton beams from 450 GeV/c to 7 TeV/c where the beams are brought into collision at four interaction points. The energy stored in each beam 350 MJ exceeds by more than 2 orders of magnitude the levels of existing hadron machines. To safely and efficiently operate the LHC the orbit of both beams must be stabilized during all operational phases from injection to collisions. Stabilization constraints are particularly tight around the collimators that must intercept with high efficiency particles that drift to large amplitudes to prevent quenches of the superconducting magnets. For this reason the LHC will be the first hadron collider where a real-time orbit feedback is foreseen to stabilize the beams. This presentation will give an overview of the boundary conditions expected orbit perturbances and requirements for orbit stabilization at the LHC. Strategies for the design of the feedback system will be discussed.

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#	First Name	Last Name	Institution	Country	List To
49	Tetsuhiko	Yorita	JASRI/SPring-8	Japan	List

Oral Presentation #1:

Session: Noise Source Suppression

Title #1: The optimization for the reduction of the vacuum chamber vibration via structure analysis

Abstract: As we have reported in previous IWBS we have found that the vibration of Al chambers inside the Q magnets doe to the cooling water flow makes beam orbit instability and we have succeeded to reduce them by adding chamber supports and modifying the water flow route. But the chamber vibration is still main source of beam instability in fast frequency region up to 200 Hz. In order to reduce this vibration further in the most optimized way we have established the method of optimization by means of computer aided engineering especially for 3D structure analysis.

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