cathode of the DC gap, which is connected with the 1+1/2 superconducting cavity. Simulations on beam dynamics are made to optimize the configuration. At the mean time, the coaxial coupler for microwave input is also finished. An optimized 1+1/2 model cavity is manufactured and the performance of the cavity is measured including high order modes. The niobium supconducting injector will be finished in 2001.

WPAH313 Recent Beam Diagnostic Developments at COSY-Juelich

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A new Schottky-pickup for the Cooler Synchrotron COSY at the Forschungszentrum Jülich was developed, tested and installed. The new pickup with four diagonally arranged plates replaces the two 1 m long Schottky-pickups used until now in COSY and were removed mainly due to lack of free space for new installations (e.g. rf-cavity, experimental devices); the horizontal one also due to its limited aperture. The available space for the new one amounts only 0.8 m. The pickup plates can be combined by means of relays for measurements in the horizontal and vertical plane. The pickup can be used as well as a sensitive broadband beam position monitor or as a high sensitive tuneable narrowband pickup for Schottky-noise analysis. A new method for resonant tuning of the Schottky-pickups for transversal measurements was developed and tested. The differentially excited resonant circuitry enhances the sensitivity by about a factor of 30. The pickup is also used for dynamical tune measurements (tunemeter) in the acceleration ramp.

WPAH314 Nuclotron Extracted Beam Diagnostics

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First experiments with the Nuclotron Beam Slow Extraction System (BES) were carried out in 1999-2000. The Nuclotron Control System (NCS) provided an efficient support for the BES operation during all runs. The dedicated beam diagnostics subsystem for the BES integrated into the NCS is described. The beam monitors are required to cover an intensity range from 10^3 pps (particles per second) to 10^{11} pps. To meet this requirement, several types of detectors are used for beam diagnostics: multi-wire proportional chambers, plane parallel ionization chambers, scintillation counters, fluorescent screen monitors. The subsystem hardware infrastructure consists of data links, front end industrial computers, acquisition and control modules in PC standard.

WPAH315 Bunch-by-Bunch Phase Measurements at the KEKB

Takao Ieiri, Kazunori Akai, Takashi Kawamoto (High Energy Accelerator Research Organization)

KEKB is a multi-bunch and high-current e+/e- collider. Bunch parameters such as intensity, position and phase would not be strictly the same for individual bunch. A fast gate module has been developed, which can pick up a signal of one bunch along a bunch train. The gate module was attached to the turn-by-turn beam position monitor [T. Ieiri, K. Kawamoto, NIM A 440 (2000)330] where the beam phase was measured by an orthogonal phase technique. The characteristics of the gate module were investigated. High resolution was obtained in the phase measurement using an averaging method under a constant beam condition. We measured the phase along a bunch train which contains about 1000 bunches followed by a gap. A periodic transient beam loading effect was observed and compared with the simulation [K.Akai et al., EPAC98 (1998)1749].

WPAH316 CVD-Diamond-Based Position-Sensitive Detector Test with Electron Beam from a Rhodotron(TM) Accelerator

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A position-sensitive detector using insulating-type CVD-diamond as its substrate material has been developed at the Advanced Photon Source (APS), Argonne National Laboratory and was tested with a 5 MeV electron beam from a CW Rhodotron(TM) accelerator at the STERIS Corporation. The test result shows that the free-standing insulating-type CVD-diamond acts as a solid-state ion chamber under the 5 MeV electron beam. Potential applications of the CVD-diamond-based position-sensitive detector, e.g., as a high-dose-rate beam profiler for industrial electron accelerators and radiation technologies, and the design of a beam position monitor for a linear-accelerator-based free-electron laser are discussed in this paper.

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WPAH317 Measurement of the Beam Angular Size in the Interaction Point of the VEPP-4M Collider

Anton Bogomyagkov, Elena Kremyanskaya, Nikolai Muchnoi, Yuriy Pakhotin (Budker Institute of Nuclear Physics)

We measured angular size of the beam in the interaction point from transverse spatial distribution of the Compton backscattered laser photons. The NaI calorimeter and multiwire proportional chamber monitors gamma-quanta beam. Transverse spatial distribution of the gamma-quanta is a convolution of Gaussian angular distribution of the beam particles with detector resolution and cross section of Compton backscattering process. Fitting the measured distribution of the gamma-quanta beam we obtain σ of the angular distribution with accuracy about several percents. This value of σ allows us to estimate emittance of the beam with a good accuracy.

WPAH318 Optical Measurements of Beam Parameters at VEPP-4 Storage Ring

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Optical diagnostics of VEPP-4 electron-positron collider are described. The diagnostics provide the data about position and dimensions of e-/e+ beams. The dissectors are applied for measurements of a length and transversal size of bunches. The linear CCD arrays provide the measurements of a horizontal size of the beams. The recent results of the replacement of CCD array to CCD matrix and the plans of further development of diagnostics are discussed.

WPAH319 Calibration of the VEPP-4M Collider Electron Beam Energy with Backscattered Laser Photons

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For new J/ψ(1s), ψ(2s), and τ masses measurement with the KEDR detector, the VEPP-4M collider will operate at 1200-2000 MeV beam energies. Electron beam energy calibration with backscattered laser photons, performed at BESSY I storage ring [R.Klein et al. NIM A 384 (1997) 293-298], has shown the accuracy compatible with that obtained by resonant spin depolarization technique. For the VEPP-4M collider we propose the non-head-on configuration of electron-laser beams interaction: electron beam intersects the CO_2 laser cavity axis at close to $\pi/2$ angle. The resulting spectrum of backscattered

Compton photons has two cut-offs, their sum is used to determine the electron beam energy and depends weakly from the intersection angle. The estimated accuracy for beam energy calibration is better then 10^{-4}.

WPAH320 A New Relative Proton Polarimeter for RHIC

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The RHIC spin program requires excellent polarimetry so that the knowledge of the beam polarization does not limit the errors on the experimental measurements. However, polarimetry of proton beams with energies higher than about 30GeV poses a difficult challenge. For polarization monitoring during operation, a fast and reliable polarimeter is required that produces a polarization measurement with a 10% relative error within a few minutes. The p-Carbon elastic scattering in the Coulomb-Nuclear-Scattering (CNI) region has a calculable and large analyzing power, but detecting the recoil carbon needs a sophisticated detector system and a very thin target. This paper describes the design issues as well as the preliminary results from first polarized proton commissioning in RHIC.

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WPAH321 Semiconductor Detector for nA Ion Beam of Low Energy

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The silicon semiconductor diod with p-n transition opened into vacuume is used as detector. Transition closed by voltage 20-50V provides stable gain ~ 1000 independently from kind of ions at the level of ion energy 60kV and impulse beam current a few nA. Due to large gain and low noise itself detector gives reliable measurements. Two ways of using such detectors are described. Result of measurements by this detector of a few μA impulse current of 2 MeV proton beam is present also.