using a Fault Tree methodology to examine likely failure modes and system integrity. The analysis takes into account both hardware and human factors. This paper briefly presents the SRS PSS and discusses the outcome of the recent review and analysis.

WPPH126 Secondary Particle Production and Residual Activation for the MiniBooNE Target Area

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MiniBooNE is a new accelerator based neutrino oscillation experiment, and is designed to use 9E16 protons/hour at 8 GeV from the Fermilab Booster. Secondary particle production and residual activation for the MiniBooNE target area are studied using the Monte Carlo codes MARS and the CASIM. The calculations use the latest design geometry for the BooNE horn, the target vault, decay pipe and the two absorbers. Both beam-on as well as beam-off radiation are investigated. The ground-water and surface-water contamination are also estimated. The spectra of background radiation at various locations along the target vault and the decay pipe will be presented. @ Author would like to thank N.V. Mokhov for help with MARS.

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WPPH301 5 T Non-Superconducting Wiggler

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At present at Budker Institute of Nuclear Physics the non-superconducting three pole wiggler is developed. The wiggler provides 5 T magnetic field in 20 mm pole gap with using permanent magnets and coils. Magnet design of the wiggler, its effect on electron beam dynamics of storage ring VEPP-3 and spectra of synchrotron radiation are described in given paper.

WPPH302 Pulsed Wire Magnetic Field Measurements on Undulator U10p

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A magnetic field measurement system using pulsed wire method is developed to measure the small-gap wiggler to be fabricated. A test has been done on an undulator U10p with a total length of 2m and a peak field of 1 Tesla. With the help of the experience from the labs of R.W. Warren, O. Shahal and A.A. Varfolomeev, the feasibility of applying the system to measuring the long insertion devices with high peak field is systematically studied . A different approach to study the weak signal of spurious components in the normal signal is presented in this paper.

WPPH303 Automation of the Lebedev Physical Institute Synchrotron to the Energy 1.3 GeV as the First Stage of the Accelerator Upgrade

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Lebedev Physical Institute electron synchrotron to the maximum energy up to 1.3 GeV is under operation since the mid of seventieth. It is weak focusing machine consisting of four 90-degree sectors with the radius 4 m and four straight sections between them. The microtron with the energy 7 MeV and pulse current 50 mA is used for injection into the main accelerator. The average intensity of the synchrotron is 0.1 mkA, repetition rate being equal to 50 Hz. Extracted electron beam and bremstrahlung photons are used for the experiments in the field of nuclear and elementary particles physics. The most remarkable achievement at this machine is the discovery of creation and decay of eta-mesic nuclei arising from reaction of high energy photons with carbon nuclei, having been made at the end of 90th. Up to now computer was not used for synchrotron parameters monitoring and control. We expect that automation might improve the main parameters of the accelerator as well as time dependent stability of the electron energy and intensity. The paper is the extraction from conception design of accelerator automation project. We plan to use the concept and experience acquired during development of the Lebedev Physical Institute Radiation Complex. The basis of this concept is the flexible computer interface at the level of executable that allows build any desirable representation of acquired data as well as controls to affect the accelerator systems.

WPPH304 Field Distribution and Beam Dynamics in Planar Electromagnetic Undulator

VYACHESLAV KURAKIN (LEBEDEV PHYSICAL INSTITUTE)

High Tc superconducting materials are attractive for the use in undulator design. Nitrogen cryogenics is not complicated and expensive technology but allows to rich current densities in superconducting wire much higher than that in copper conductor, thus making it possible to form high static magnetic fields at short spatial periods. Undulator design had been suggested at Lebedev Physical Institute, that might be fabricated from high Tc superconducting foil, this technology being available in Russia. The idea is to use wiggling conducting strip with current flowing in the direction of spatial periodicity as the basis of undulator design. For the strip being infinite in the direction perpendicular both to current and the direction of wiggling the charge that moves in the mid plane sees magnetic field of alternating polarity while traversing strip. A possible undulator design is the combination of two identical parallel strip. In such a configuration amplitude of magnetic field drops on undulator axis but not drastically. The paper is devoted to the quantitative analysis of different undulator schemes based on idea suggested. This includes field calculation, beam stability and particle trajectories investigation at the undulator entrance and exit. The problem of undulator excitation as well as the questions of field correction are included too.

WPPH305 Design and Test of Optical Klystron for FEL

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The Free Electron Laser (FEL) is the most promising coherent light source from VUV to soft X-rays. An optical klystron (OK), which means for FEL research in NSRL, was designed and constructed with NdFeB magnets. The analysis equations for designing the OK are given and checked by the finite element computation, the 3-dimensional electromagnetic computation software, Opera-3d and the measured field. The measured B-H curve of the magnet is used in the computation. The computed induction field in the beam axis, quite well matches the field measured by hall probe with dimensions of 0.1mmx0.1mm. The typical parameters of the optical klystron are given. The magnet gaps of the three OK undulator sections can be independently tuned from 40mm to 140mm. The spontaneous emission experiment of the OK is given.

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WPPH306 Upgrade of NSRL Optical Klystron for FEL

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One symmetry optical klystron (OK), which means for FEL research in NSRL, will be upgraded to asymmetry structure for generating more powerful coherent harmonic after measuring the OK spontaneous emission spectrum.