resonance; the power deposited as a function of Q has been calculated for this case. Transverse instabilities/magnifications and deposited power have also been determined analytically (published separately).

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TPPH136 Initial and Subsequent Growth of the Fast Ion ("Ion Hose") Instability

ROBERT BOSCH (SYNCHROTRON RADIATION CENTER)

The fast ion instability is considered for a distribution of ion bounce frequencies. Because of the spread in bounce frequencies, the instability initially grows exponentially with propagation distance. When the initial growth saturates, the instability grows exponentially with the square root of the propagation distance; the saturated growth equals that calculated when the spread in ion bounce frequencies is neglected. For a broad distribution of ion bounce frequencies, instability may be prevented by a betatron damping rate that exceeds the incoherent betatron frequency shift induced by ions at the tail of the bunch train.

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TPPH137 Influence of the Momentum Compaction upon Landau-Cavity Stability

ROBERT BOSCH, J. J. BISOGNANO, K. J. KLEMAN (SYNCHROTRON RADIATION CENTER)

A fourth-harmonic "Landau" RF cavity suppresses coupled bunch instabilities and increases the beam lifetime of the Aladdin electron storage ring. When the storage ring is operated with a low momentum compaction, instabilities limit the utility of the Landau cavity. Analytic modeling and simulations suggest that the instabilities result from fast mode-coupling between the dipole and quadrupole Robinson modes. The modeling and simulations may be used to optimize the RF feedback gain for improved stability.

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TPPH138 Observation of the Dynamic Beta Effect for Various Buch Lengths at VEPP-2M

IGOR NESTERENKO, PETR IVANOV, ALEXANDER VALISHEV (BUDKER INSTITUTE OF NUCLEAR PHYSICS)

For particles with small amplitudes the beam-beam interection is like additional linear focusing (in the first approximation) that results in the beta function distortion. The observations of this so-called effect dynamic beta for the various bunch lengths at VEPP-2M collider are presented.

TPPH139 Experimental Study of Flip-Flop Phenomenon at VEPP-2M

IGOR NESTERENKO, PETR IVANOV, ALEXANDER VALISHEV (BUDKER INSTITUTE OF NUCLEAR PHYSICS)

Experimental results of the flip-flop phenomenon study at VEPP-2M collider are presented. The agreement between the observations and expected simulated behaviours is emphasized.

TPPH140 Correction of the Betatron Coupling and Closed Orbit Distortion at the VEPP-2000 Collider

ALEXANDER VALISHEV, EUGENE PEREVEDENTSEV, DMITRY SHWARTZ (BUDKER INSTITUTE OF NUCLEAR PHYSICS)

An essential condition for the round beam mode operation at the VEPP-2000 storage ring is the zero betatron coupling in the arc between two Interaction Points. To comply with this requirement the closed orbit should be corrected and the proper skew quadrupole correction system must exist. This work presents the development of the dipole and skew quadrupole correction systems for VEPP-2000. The calculations of correction of the linear betatron coupling due to solenoids are compared to the measurement results from the VEPP-2M storage ring.

TPPH141 Coherent Dipole Synchro-Betatron Beam-Beam Modes in Asymmetric Ring Colliders

ALEXANDER VALISHEV, EUGENE PEREVEDENTSEV (BUDKER INSTITUTE OF NUCLEAR PHYSICS)

Following the work by Hirata and Keil [Nucl. Instrum. Methods A292, 156 (1990)] we study the coherent dipole beam-beam effects in asymmetric two-ring colliders and take into consideration the synchro-betatron beam-beam modes. The effect of these modes on the density of resonances in the tune diagram is shown for the case of different ring circumferences, resulting in reduction of the available tune space.

TPPH142 Experimental Study of the Coherent Beam-Beam Effects at the VEPP-2M Collider

ALEXANDER VALISHEV, IGOR NESTERENKO, EUGENE PEREVEDENTSEV (BUDKER INSTITUTE OF NUCLEAR PHYSICS)

In this work we present the results of coherent dipole synchro-betatron beam-beam modes observation at the VEPP-2M storage ring. The mode spectrum dependence on the beam-beam parameter is compared to the analytical and numerical models. The tune split of coherent beam-beam modes is measured and its relation with the beam-beam parameter is discussed.

TPPH143 Coherent Synchro-Betatron Beam-Beam Modes: Enhanced Model

ALEXANDER VALISHEV, EUGENE PEREVEDENTSEV (BUDKER INSTITUTE OF NUCLEAR PHYSICS)

Our previous studies revealed a multi-line structure in the spectrum of coherent dipole beam-beam oscillations due to coupled synchro-betatron beam-beam modes. The model employed in analytical and numerical analysis assumed linearization of the beam-beam kick and took account of the finite length of the colliding bunches. The latter were represented with the single amplitude of the synchrotron oscillations, giving rise to the so-called azimuthal modes. In the present paper we use more realistic distributions over the synchrotron oscillation amplitudes and discuss the behaviour of the radial synchro-betatron modes in the linearized beam-beam system, obtained both analytically and numerically, with the account of nonlinearity of the synchrotron oscillation resulting from the potential well distortion.

TPPH144 Beam-Beam Simulation for the e+ e- Collider with Strong Betatron Coupling at Interaction Point

SERGEI NIKITIN, EUGENY SIMONOV (BUDKER INSTITUTE OF NUCLEAR PHYSICS)

As was shown before [S.A. Nikitin and I.Ya. Protopopov, Preprint Budker INP 99-44 (1999)], there exists a simple possibility to compensate betatron coupling caused by the longitudinal magnetic field of the KEDR detector at VEPP-4M using two skew quads instead of compensating solenoids. This variant implies the coupling to be localized at the section with KEDR and skew quads. A vertical beam size at the interaction point can be considerably increased depending on the longitudinal field magnitude. With the aim to clarify, if it is possible to preserve or to increase the luminosity in such conditions at expanse of increasing the beam currents, the special beam-beam simulation has been performed. The simulation model is based on the weak-strong approximation with taking into account for longitudinal motion. We study behavior of the transverse beam sizes versus the beam current, the KEDR field value, betatron and synchrotron tunes. An influence of radial dispersion at I.P., which is large at VEPP-4M, is under study too. Numerical results are presented and discussed.