Discriminating Z' from anomalous gauge coupling signatures in $e^+e^- \to W^+W^-$ at International Linear Collider

V.V. Andreev, A.A. Pankov
Theoretical Physics Department, F. Scoryna Gomes State University, Gomel, Belarus,
e-mail: quarks@gsu.by

The foreseeable sensitivity to Z's and anomalous gauge couplings of $W^\pm$-pair production cross sections at the e^+e^- International Linear Collider (ILC) is discussed. The potential of distinguishing observable effects of the Z' from analogous ones due to competitor models with anomalous trilinear gauge couplings (AGC), which can lead to the same or similar new physics experimental signatures at the ILC, is studied.

Dynamics of an equation with a large spatially distributed control

I. Kashchenko
Yaroslavl State University, Yaroslavl, Russia, e-mail: iliyask@uniyar.ac.ru

The dynamic properties of equations with spatially distributed parameters have been studied. Specifically, we examine the dynamic properties of the spatially distributed scalar complex quation with qubic nonlinearity.

$$\dot{u} = (a - b|u|^2)u + Ke^{i\varphi}\left(\int_{-\infty}^{\infty} F(s)u(t, x+s)ds - u\right)$$

with the periodic boundary conditions $u(t, x+2\pi) \equiv u(t, x)$. The research technique is based on the special asymptotic method. In this context, the parameter K is assumed to be sufficiently large: $K \gg 1$. As result, special nonlinear families of generally parabolic evolution equations (without small or large parameters) have been constructed to determine the leading terms of the asymptotic representations of solutions to the original boundary value problem. The presence of the continual parameter in these families suggests that multistability is characteristic of principal system with a large spatially distributed control parameter.

Generalized Finser structures related to Mueller matrices within the Stokes formalism

V. Red'kov, V. Balan
Institute of Physics, NAS Belarus; University Politehnica of Bucharest, Romania

The theory of the Lorentz group provides clues for approaching problems of light polarization optics in the frames of the vector Mueller and spinor Jones formalisms. Differences in describing completely polarized vs. partly polarized light correlate with the properties of isotropic and time-like vectors in Special Relativity. The enveloping framework for the involved geometric objects is the

GL(4,R) matrix ansatz. In our work, the parametrization of 4 × 4-matrices M of the real linear group GL(4,R) involves the Dirac matrices, four real 4-vector (k,m, n, l) appear as parameters for possible Mueller matrices. In this realization, the determinant - assumed non-vanishing in our developments - is a 4-th order homogeneous polynomial in the parameters, hence naturaly providing a locally-Minkowski m-th root metric of Finsler type. While subclasses of Mueller matrices belonging to specific Lie groups are considered, their pre-existent Lie group metric induces on the Mueller intersection a Riemannian metric, which canonically further provides jointly with the Finlser tensor field a geometric (h,v) structure on the tangent space of the manifold. The specific geometric objects of the mixed structure are explicitly determined, and are shown to provide information on the considered subsets of Mueller matrices. The extended Einstein and Maxwell equations of the (h,v)-geometric approach and of the associated geometric objects (curvatures, torsions, Ricci tensors and scalars of curvature, extended Einstein tensors, KCC invariants, deflections and extended electromagnetic tensors) are constructed and discussed from physical point of view.

The control of chaotic regimes in encryption algorithm based on dynamic chaos

A.V. Sidorenko, K.S. Mulyarchik

Radiophysics and Computer Technologies Department, Belorusian State University, Minsk, Belarus, e-mail: sidorenkoa@yandex.ru

The chaotic regime of a dynamic system is the necessary condition to define the cryptofirmness of an encryption algorithm. The chaotic regime control using the parameters of the nonlinear dynamics method for analysis of the encrypted data based on a dynamic chaos is proposed.

Ones upon a time in the Plane. The Wada lakes and vortex streets problems are solved

S.A. Sivockon', I.A. Kowalew, D.W. Serow

Saint-Petersburg State Polytechnical University, 195251 Politechnicheskaya 29, Saint-Petersburg, Russia, e-mail: dimusum@yandex.ru

The Wada lakes problem and vortex streets problems are solved. There subsists Wada lakes two topological types m+1 and n+2, m and n are integer. Moreover Wada lakes common boundary is an atom being the Birkhoff curve. The simple examples for vortex streets and Wada lakes are presented.