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

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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

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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.