

## The relativistic electrodynamics least action principles revisited: new charged point particle and hadronic string models analysis

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The work is devoted to studying some new classical electrodynamics models of interacting charged point particles and related with them the quantization via Dirac procedure aspects. Based on the vacuum field theory no-geometry approach, developed by authors in [2,3], the Lagrangian and Hamiltonian reformulations of some alternative classical electrodynamics models are devised. The Dirac type quantization procedure for the considered alternative electrodynamics models, based on the obtained canonical Hamiltonian formulations, is developed. The classical relativistic least action principle [1] is revisited from the vacuum field theory approach and analyzed in detail. New physically motivated versions [2-4] of relativistic Lorentz type forces acting on a point charged particle are derived, a new relativistic hadronic string model is proposed and analyzed in detail. New string dynamic equations with distributed mass and charge densities are obtained with respect to the proper reference system time parameter.

1. Barbashov B. M., Nesterenko V. V. *Introduction to the relativistic string theory*. World Scientific, Singapore, 1990
2. Prykarpatsky A.K., Bogolubov N.N. (Jr.) and Taneri U. *The vacuum structure, special relativity and quantum mechanics revisited: a field theory no-geometry approach*. Theoretical and mathematical physics, Moscow, RAS, 2008 (in print) (arXiv lanl: 0807.3691v.8 [gr-gc] 24.08.08)
3. Prykarpatsky A.K., Bogolubov N.N. (Jr.) and Taneri U. *The field structure of vacuum, Maxwell equations and relativity theory aspects*. Preprint ICTP, Trieste, IC/2008/051 (<http://publications.ictp.it>)
4. Bogolubov N.N., Prykarpatsky A.K. *The Lagrangian and Hamiltonian formalisms for the classical relativistic electrodynamical models revisited*. arXiv:0810.4254v1 [gr-qc] 23 Oct 2008