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Pseudo-classical spin systems of relativistic particles are usually considered as the toy-models when treating the problems of quantization in string theory. Due to nilpotent nature of the dynamical variables the practical significance of these models becomes possible after one employs the procedure of averaging over Grassmann degrees of freedom with the help of Berezin-Marinov (BM) density matrix. On the other hand, the application of classical Frenkel model to obtain (major) spin contributions to synchrotron radiation (SR) gave an insight into puzzle with their unusual sign. It is notable also that in what concerns the spin radiation effects, the widely used BMT model of spinning charge gives only a part of QED spin corrections to SR. The purpose of our work was to investigate the correspondence between pseudo-classical Berezin-Marinov (BM) model and Frenkel model. In the case of homogeneous external field background we show that classical Frenkel equations for the spin and for the trajectory of electron could be obtained within BM pseudo-classical mechanics. The proof makes use of indefinability of the nilpotent Lagrange factor λ present in BM Lagrangian and employs the above mentioned procedure of averaging. That indefinability is a peculiar property of BM model. The correspondences between constraints in both models are also discussed.

Biography

Tereshchenko Vladimir Vladimirovich has received his Master's degree, and has completed Postgraduate course at Surgut State University (SurSU). He is the Lecturer and Deputy Director of the Polytechnic Institute of SurSU. He is engaged in the research of Spin Radiation Effects with Classical Electrodynamics.

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