

About toroidal leptons in space-time film theory

Thursday 7 September 2023 12:50 (30 minutes)

Nonlinear field model of extremal space-time film is considered as unified field model [1-6]. Its space-localized solutions representing the elementary particles are investigated. In particular, we consider the field configuration having a form of the twisted lightlike soliton moving along the ring of the toroidal coordinate system. The exact solutions in the form of twisted light-like solitons moving in a straight line were found in [1]. As was shown in this work, the solitons of defined subclass of obtained solutions can be considered as photons. In the present work, we consider the approximate time-periodic solution in the quasi-cylindrical toroidal coordinate system with rotation. The inverse ring radius appears as a small parameter. We consider the exact solutions in the cylindrical coordinate system obtained in the work [1] as the initial approximation. We propose the initial approximation in the form of combination of the charged tubular shell and twisted lightlike soliton. Methods for determining the values of parameters of the initial approximation are considered. The correspondence of this class of solutions to real leptons is discussed.

-
- [1] Chernitskii A.A. Lightlike shell solitons of extremal space-time film. J. Phys. Commun., 2018, vol. 2, 105013.
 - [2] Chernitskii A.A. About long-range interaction of spheroidal solitons in scalar field nonlinear model. J. Phys.: Conf. Ser., 2017, vol. 938, iss. 1, 012029.
 - [3] Chernitskii A.A. About toroidal soliton-particle of extremal space-time film. J. Phys.: Conf. Ser., 2020, vol. 1435, 012054.
 - [4] Chernitskii A.A. Gravitation in theory of space-time film and galactic soliton. J. Phys.: Conf. Ser., 2021, vol. 2081, 012016.
 - [5] Chernitskii A.A. About toroidal model of leptons in space-time film theory. JPS Conf. Proc., 2022, vol. 37, 020608.
 - [6] Chernitskii A.A. On leptons in the theory of space-time films. Phys. Part. Nucl., 2023, vol. 54, pp. 685-692.

Primary author: Dr CHERNITSKII, Alexander (St. Petersburg State Chemical and Pharmaceutical University)

Presenter: Dr CHERNITSKII, Alexander (St. Petersburg State Chemical and Pharmaceutical University)

Session Classification: Plenary