

Donev, Stoil; Tashkova, Maria

Nonlinear connections and description of photon-like objects. (English) [Zbl 1219.83002](#)

Mladenov, Ivaïlo M. (ed.), Proceedings of the 9th international conference on geometry, integrability and quantization, Sts. Constantine and Elena, Bulgaria, June 8–13, 2007. Sofia: Bulgarian Academy of Sciences (ISBN 978-954-8495-42-4/pbk). 187-197 (2008).

The fundamental particle photon and the basic idea of nonlinearity receive attention here. The powerful notion of photon-like objects in nature is introduced and discussed briefly in the paper. The nonlinear connection view on the Frobenius integrability theory on manifolds is considered as a useful frame in which an appropriate description of photon-like objects can be successfully developed and investigated.

The specific sections are: The notion of photon-like objects (PhLO); Nonlinear connections; Back to PhLO; Translational-rotational consistency. There are two figures illustrating certain theoretical examples. Presented are also 3 propositions with proof and discussion. The intricate and interesting relationships between mathematics and physics are spelt out in a very subtle, useful manner. This invites more intensive efforts for establishing further results on the concepts of nonlinearity and the beautiful photon.

For the entire collection see [[Zbl 1154.17001](#)].

Reviewer: Paninjukunnath Achuthan (Madras)

MSC:

- [83-02](#) Research exposition (monographs, survey articles) pertaining to relativity and gravitational theory
- [83D05](#) Relativistic gravitational theories other than Einstein's, including asymmetric field theories
- [83C10](#) Equations of motion in general relativity and gravitational theory
- [83C50](#) Electromagnetic fields in general relativity and gravitational theory
- [83E05](#) Geometrodynamics and the holographic principle
- [78A25](#) Electromagnetic theory (general)

Keywords:

[gravitational theory](#)

Full Text: [arXiv](#)