

NONLINEAR CONNECTIONS AND DESCRIPTION OF PHOTON-LIKE OBJECTS

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Abstract. The notion of photon-like objects is introduced and briefly discussed. The nonlinear connection view on the Frobenius integrability theory on manifolds is considered as a frame in which appropriate description of photon-like objects to be developed.

1. The Notion Of Photon-Like Objects

We begin with giving the notion of **photon-like object(s)** (PhLO) which notion will be considered further from the point of view of theoretical modeling under the assuming that PhLO are *free*, i.e., interaction of any form of individual PhLO with any other physical object(s) is excluded. The notion we are going to consider reads as follows:

*PhLO are real massless time-stable physical objects with
a consistent translational-rotational dynamical structure.*

We give now some explanations concerning the above formulated notion of photon-like objects. The feature “real” means:

- PhLO *necessarily* carry energy-momentum
- PhLO can be *created* and *destroyed*
- PhLO are spatially *finite* and they carry finite integral values of physical quantities
- PhLO *propagate* and they do NOT move.

The feature “massless” means:

- their integral energy E and momentum p satisfy $E = cp$, where c is the velocity of light in vacuum