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ON PNDP-MANIFOLD

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Abstract. We provide a possible way of constructing new kinds of manifolds which we will call Partially Negative Dimensional Product manifold (PNDP-manifold for short).
In particular a PNDP-manifold is an Einstein warped product manifold of special kind, where the base-manifold B is a Remannian (or pseudo-Riemannian) product-manifold $B = \Pi_{i=1}^{q'} B_i \times \Pi_{i=(q'+1)}^{\widetilde{q}} B_i$, with $\Pi_{i=(q'+1)}^{\widetilde{q}} B_i$ an Einstein-manifold, and the fiber-manifold F is a derived-differential-manifold (i.e., F is the form: smooth manifold $(\mathbb{R}^d)+$ obstruction bundle, so it can admit negative dimension).
Since the dimension of a PNDP-manifold is not related with the usual geometric concept of dimension, from the speculative and applicative point of view, we try to define this relation using the concept of desuspension to identify the PNDP with another kind of "object", introducing a new kind of hidden dimensions.

1. Introduction and Preliminaries

The concept of negative dimensional space is already used in linguistic statistics [1]. Also in supersymmetric theories in Quantum Field Theory, negative dimensional spaces are used [2].

Let $E \cong M \times F$ be a fiber bundle with base space M and its fiber F. We will discuss now a case, where the fiber has negative dimension. Note that the total dimension of the fiber bundle is given by the relation $\dim E = \dim M + \dim F$. We will consider the case, where the base manifold has greater positive dimension than the negative dimension of the fiber is $\dim M > -\dim F$. In this case, the dimension of the total fiber bundle is still positive. Since the base manifold is obtained by projection of the fiber bundle along the fiber by projection operator π_F, we have $\pi_F E = M$ i.e. the projection of the lower-dimensional fiber-bundle along the fiber yields the higher dimensional base manifold space. Therefore, the projection operator π_F along the negative-dimensional

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