On PNDP-manifolds

Alexander Pigazzini
Mathematical and Phisical Science Foundation
pigazzinialexander18@gmail.com

Saeid Jafari
College of Vestsjaelland South, Herrestraede 11, and Mathematical and Physical Science Foundation, 4200 Slagelse, Denmark
jafaripersia@gmail.com

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 "virtual" negative dimension).
Since the dimensions of a PNDP-manifold is not related with the usual geometric concept of dimension (we consider they as "virtual" dimensions), from the speculative and applicative point of view, we use special projections/desuspensions, to identify the PNDP with another type of "object" of the same dimension, thus introducing a new type of "hidden" dimensions.
We have consider three kinds of PNDP-manifolds:

Type I) the $(n, -n)$-PNDP manifold that has overall, zero-dimension ($dimM = dimB + dimF = n + (-n) = 0$). The speculative result may be interpreted as an "invisible" manifold but made up of two manifolds with n and $-n$ dimensions, respectively, then we try to consider it as a kind of "point-like manifold" (zero-dimension), but with "hidden" dimensions, and

Type II) the $(n, -d)$-PNDP manifold, where n (the base-manifold dimen-

sion) is different from d (with d a positive integer number and the fiber-manifold dimension is $m = -d$) such that $dim = n + (-d) > 0$. The particular speculative feature of this manifold is that it appears as another Einstein-manifold with $(n + (-d))$-dimension.

Type III) it is like the *Type II*, but $dim = n + (-d) < 0$. It has the speculative feature of being considered, through our projection, like $||(n - d)||$-th desuspension of a point.

These manifolds, introducing this new concept of "hidden" dimensions, could have some applications, in particular in the description of "point-like" structures, as a structure of superconducting graphene or in the MOG theory without anomalies, but recently also in the econophysical field, in the description of financial markets influenced by ghost fields such as dark volatility.

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