MR3780575 53C15 57R35
Pervova, Ekaterina (I-PISA)
On the notion of scalar product for finite-dimensional diffeological vector spaces. (English summary)
Electron. J. Linear Algebra **34** (2018), 18–27.

It is well known [cf. P. Iglesias-Zemmour, *Diffeology*, Math. Surveys Monogr., 185, Amer. Math. Soc., Providence, RI, 2013; MR3025051] that any finite-dimensional diffeological vector space admitting a smooth scalar product is necessarily the usual $\mathbb{R}^n$ with its usual smooth structure. There are three choices at this point:

(1) to concentrate on infinite-dimensional spaces;
(2) to consider a kind of pseudo-metric;
(3) to redefine scalar products as ones taking values in $\mathbb{R}$ endowed not with the standard diffeology but with the piecewise-smooth diffeology.

This paper chooses the second approach, and many of the results in the paper belong to the folklore among the people working in diffeology. *Hirokazu Nishimura*

References

1. P. Iglesias-Zemmour. *Diffeology*. Mathematical Surveys and Monographs, Vol. 185, AMS, Providence, 2013. MR3025051
2. E. Pervova. Multilinear algebra in the context of diffeology. Preprint, arXiv:1504.08186v2.
3. E. Pervova. Diffeological Clifford algebras and pseudo-bundles of Clifford modules. Preprint, arXiv:1505.06894v2.
4. J.M. Souriau. Groups différentiels. In: P.L. Garcia, A. Perez-Rendon, and J.M. Souriau (editors), Differential Geometrical Methods in Mathematical Physics (Proceedings of the Conference Held at Aix-en-Provence, September 3-7, 1979, and Salamanca, September 10-14, 1979), *Lecture Notes in Mathematics*, Springer, 836:91–128, 1980. MR0607682
5. J.M. Souriau. Groups différentiels de physique mathématique. South Rhone Seminar on Geometry, II (Lyon, 1984), Astérisque 1985, Numéro Hors Série, 341–399. MR0753860
6. M. Vincent. Diffeological Differential Geometry. Master Thesis, University of Copenhagen, 2008 (available at http://www.math.ku.dk/english/research/top/paststudents/martinvincent.msthesis.pdf).
7. E. Wu. Homological algebra for diffeological vector spaces. *Homology, Homotopy and Applications*, 17:339–376, 2015. MR3350086

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.