

NON-SIMPLE STRONGLY NILPOTENT DISTRIBUTION GERMS

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All known to-date Goursat structures featuring moduli of the local classification appear not to be strongly nilpotent. That is, not being equivalent to their nilpotent approximations. In the course of obtaining more and more (if disparate) confirmations of that statement, like in [1] and [2], a natural problem in the nonholonomic analysis has been gradually imposing by itself: to find a concrete unimodal family of strongly nilpotent completely nonholonomic distributions. The search for such an example seems by now hopeless in the realm of Goursat structures *per se*. Yet, by a neat perturbation of rank-two Goursat distributions in the underlying dimension 7 we obtain now a 1-parameter family of strongly nilpotent pairwise nonequivalent distribution germs. That family is given in local coordinates that happen to be already adapted. The members of the family are all quasi-homogeneous with respect to the weights defined by the small growth vector, one and the same for all members of the family. This property automatically yields their strong nilpotency, and also facilitates a proof of their pairwise non-equivalence.

REFERENCES

- [1] Piotr Mormul. Do moduli of Goursat distributions appear on the level of nilpotent approximations? *Trends in Mathematics*. Birkhäuser, 2006, 229–246.
- [2] Piotr Mormul. A single nilpotent approximation for a family of nonequivalent distributions. *J. Math. Sci. Adv. Appl.* **26** (2014), 1–27.