

Do exotic moduli of Goursat flags exist already in codimension two?

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In [4] produced were first two examples of the so-called *exotic moduli* of Goursat distributions. Meaning that those moduli of the local classification of Goursat distributions emerged via the pattern (2c) on the list, in [2], of five *à priori* possible patterns of local prolongations of Goursat flags. On that list, only two last patterns (2c) and (3) were potentially creating new numerical moduli of the local classification. The pattern (3) was fairly intuitive and already backed (by that time) experimentally. It was otherwise with pattern (2c). The existence question for (2c) was answered, in the affirmative, only by the examples in [4]. However, they both were in codimension **four**. Later, in [5], there was produced an example of exotic modulus in codimension **three**.

On the other hand, it has been known since long that the classification in codimension **one** is discrete, whence the interest in the codimension **two** Goursat singularities. All moduli in codimension two found to-date arise via pattern (3). It is a standing question whether there exist pattern-(2c)-moduli in codimension two.

We would like to report on the ongoing search for such exotic moduli in codimension two. This search exploits, among other things: (a) a bridge, built in [3], between the singularities of Goursat flags and of Legendre curves for a fixed contact 3D structure, as well as (b) the machinery set in motion in [1] of dealing with singularities of legendrian curves as such.

References

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- [4] P. Mormul; *Examples of exotic moduli in local classification of Goursat flags*. UIAM **38** (2000), 17–28.
- [5] P. Mormul; *Exotic moduli of Goursat distributions exist already in codimension three*. Contemporary Mathematics **459**, AMS 2008, 131–145.