HOW TO STRATIFY SPECIAL MULTI-FLAGS AND GEOMETRICALLY ENCODE THE EMERGING STRATA

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Classical Goursat distributions have been satisfactorily understood only when visualised on monster manifolds, as the outcomes of series of Cartan's prolongations (started from the tangent bundle to a 2-surface). Kumpera-Ruiz coordinates – that serve as unequalled night glasses for Goursat flags (and are much older than the monster constructions) – are then becoming more than natural. The KR coordinates on monsters allow the very basic *Kumpera-Ruiz classes* of Goursat germs defined in [1] to be re-examined and, in a sense, rediscovered in the process of prolongations.

Likewise, special multi-flags start to be properly understood when viewed on [even bigger than for Goursat] Monster Manifolds, resulting from series of *generalized* Cartan prolongations (gCp) described in [2]. On the other hand, it is known for some years now that special multi-flags are best visible in so-called Extended Kumpera-Ruiz coordinates. It so happens that the EKR coordinates are a matter of course on Monsters – just the first thing coming to mind, given the gCp operation. Whence the question about analogues for special multi-flags of KR classes/Goursat.
Such analogues can be defined right out of the EKR coordinates on Monsters (*reversing* the order of observations made, in the course of years, for Goursat objects). These are the EKR classes constructed in [2]. Our first objective is to present them in detail during the Workshop.

The EKR classes have been put on a solid geometric footing only later in [3], and termed *singularity classes*. Discussing that footing is cardinal, albeit time-consuming, cf. [4]. Instead – and this is our second objective – we want to propose a super-encoding of the strata of obtained stratification(s). It is geometry itself, seconded by Lie algebra, that (super-)encodes every single singularity class. At present we do not know if that encoding is injective in all widths and lengths, for all singularity classes; only believe in its being injective. This is a standing open question.

References

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[3] ——; *Geometric singularity classes for special k-flags, $k \geq 2$, of arbitrary length.* Singularity Theory Seminar, S. Janeczko (ed.), Warsaw Univ. of Technology, 8 (2003), 87 – 100.
[4] ——; *Special 2-flags, singularity classes and polynomial normal forms for them*, Sovremennaya Matematika i ee Prilozhenija **33** (2005), 131 – 145 (in Russian).