▶ YEVGENIY VASILYEV, *Linearity and pairs of geometric structures.*
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A theory T is called geometric if in all of its models algebraic closure satisfies the exchange property, and T eliminates the quantifier $\exists^\infty$. The class of geometric theories includes both o-minimal theories (extending DLO) and strongly minimal theories, where there is a clear dividing line between linear and non-linear structures, with linearity characterized by various equivalent conditions (e.g. the CF property and non-interpretability of infinite fields in the o-minimal case, 1-basedness and local modularity in the strongly minimal case). Situation is more complicated in the SU-rank 1, thorn rank 1 and geometric cases, e.g. in the SU-rank 1 case local modularity is stronger than 1-basedness.

We analyze linearity-like conditions using lovely pairs of geometric structures, a common generalization of lovely (generic) pairs of supersimple SU-rank 1 structures [2] and dense pairs of o-minimal structures [4]. We call a geometric theory weakly locally modular, if in a lovely pair (M, P) of its models the pregeometry $(M, acl(- \cup P(M)))$ of the localization of acl at $P(M)$ is modular. This property coincides with 1-basedness in the SU-rank 1 case, and with the CF property in the o-minimal case, and implies that the geometry of $(M, acl(- \cup P(M)))$ is a disjoint union of projective geometries over division rings and/or a trivial geometry. It is shown in [2, 3] that for an SU-rank 1 theory T, T_P is supersimple of SU-rank 1, 2 or ω. Gareth Boxall [1] has established superrosiness of T_P for a superrosy theory T of thorn-rank 1. We show that if, in addition, T is weakly locally modular, then T_P has thorn-rank ≤ 2. Using the Trichotomy theorem we show that for an o-minimal theory T extending DLO, T_P is superrosy of thorn-rank 1, 2 or ω.

This is a joint work with Alexander Berenstein.

[1] Gareth Boxall, *Superrosiness and imaginaries in lovely pairs of geometric structures*, preprint, 2008.

[2] Evgueni Vassiliev, *Generic pairs of SU-rank 1 structures*, ***Annals of Pure and Applied Logic***, vol. 120 (2003), pp. 103–149.

[3] ——— *On pseudolinearity and generic pairs*, ***Mathematical Logic Quarterly***, to appear.

[4] Lou van den Dries, *Dense pairs of o-minimal structures*, ***Fundamenta Mathematicae***, vol. 157 (1998), pp. 61–78.