

Generic derivations

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Given an algebraically bounded theory T expanding a field of characteristic 0 , consider the expansion T_d of T with one extra function $d(x)$ and an axiom saying that d is a derivation. This theory T_d has a model completion T_d^* with interesting geometric and model-theoretic properties which are inherited by T .

Theorem.

(1) If T is stable, then $T = \text{ACF}$ and $T_d^* = \text{DCF}$

(2) If T is simple, then T is supersimple of rank 1 and T_d^* is supersimple of rank ω

(3) If T is rosy, then it is superrosy of rank 1

(3) If T_d^* has Geometric Elimination of Imaginaries, then T_d^* is superrosy of rank ω

We also consider the case when T is not algebraically bounded, and give necessary and sufficient conditions for the existence of T_d^*

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