

SAP and ED properties for algebras with involution

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Develop a notion similar to SAP (Strong Approximation Property) fields or ED (Effective Diagonalization property) fields for algebras with involution, and study its consequences for hermitian forms and the Witt group $W(A, \sigma)$. The SAP and ED properties characterize when the so-called Weak Hasse Principle (that links the existence of nontrivial zeroes of quadratic/hermitian forms to positivity of these forms) holds for fields and algebras with involution (of the first kind), respectively, cf. [3]. The proposed topic fits within the supervisor's joint project with V. Astier on developing noncommutative real algebra. The candidate is expected to have a strong background in algebra, including some familiarity with orderings on fields or quadratic and hermitian forms (ideally both).

References

- [1] V. Astier and T. Unger. Positive cones and gauges on algebras with involution. *International Mathematics Research Notices*, published on-line 30/12/2020, 1–45
- [2] V. Astier and T. Unger. Positive cones on algebras with involution. *Advances in Mathematics* 361:106954, 2020.
- [3] D.W. Lewis, C. Scheiderer and T. Unger. A weak Hasse principle for central simple algebras with an involution. *Proceedings of the Conference on Quadratic Forms and Related Topics* (Baton Rouge, LA, 2001). *Doc. Math.* (2001), Extra Vol., 241–251.