

Epkenhans, Martin

On trace forms of algebraic number fields. (English) [Zbl 0777.11009](#)

Arch. Math. 60, No. 6, 527-529 (1993).

Let K be a field of characteristic $\neq 2$, A/K a finite dimensional commutative and étale algebra over K . The quadratic form $A \rightarrow K : x \mapsto \text{tr}_{A/K}(x^2)$ is called trace form. Let ψ be a nondegenerate quadratic form of dimension $n \geq 4$ over K . We prove the following. If K is an algebraic number field, then there exists a field extension L/K such that the trace form of L/K is isometric to ψ if and only if no signature of ψ is negative. Each trace form of an étale algebra of odd dimension ≥ 3 defined over a Hilbertian field K of characteristic 0 is a trace form of a field extension.

Reviewer: M.Epkenhans (Paderborn)

MSC:

[11E12](#) Quadratic forms over global rings and fields

[11E04](#) Quadratic forms over general fields

[11E81](#) Algebraic theory of quadratic forms; Witt groups and rings

Cited in **2** Reviews
Cited in **6** Documents

Keywords:

étale algebra; quadratic form; trace form; field extension

Full Text: [DOI](#)

References:

- [1] P.Conner and R.Perlis, A Survey of Trace Forms of Algebraic Number Fields. Singapore 1984. · [Zbl 0551.10017](#)
- [2] M. Epkenhans, Spurformen über lokalen Körpern. Schriftenreihe Math. Inst. Univ. Münster, Ser. 244, (1987). · [Zbl 0611.10012](#)
- [3] M. Epkenhans, Trace Forms of Dyadic Number Fields. J. Number Theory 38, 359-365 (1991). · [Zbl 0731.11021](#) · [doi:10.1016/0022-314X\(91\)90024-6](#)
- [4] M.Epkenhans, On Trace Forms of Algebraic Number Fields. Preprint 1992. · [Zbl 0777.11009](#)
- [5] M. Kraskemper, Algebraic number field extensions with prescribed trace form. J. Number Theory 40, 120-124 (1992). · [Zbl 0762.11014](#) · [doi:10.1016/0022-314X\(92\)90032-K](#)
- [6] J. F. Mestre, Extensions régulières de $2e(t)$ de groupe de Galois $\neq A_n$. J. Algebra 131, 483-495 (1990). · [Zbl 0714.11074](#) · [doi:10.1016/0021-8693\(90\)90189-U](#)
- [7] A. Prestel, On trace forms of algebraic function fields. Rocky Mountain J. Math. 19, 897-911 (1989). · [Zbl 0702.11021](#) · [doi:10.1216/RMJ-1989-19-3-897](#)
- [8] W. Scharlau, On Trace Forms of Algebraic Number Fields. Math. Z. 196, 125-127 (1987). · [Zbl 0658.10025](#) · [doi:10.1007/BF01179273](#)
- [9] O. Taussky, The Discriminant Matrices of an Algebraic Number Field. J. London Math. Soc. (2) 43, 152-154 (1968). · [Zbl 0155.37903](#) · [doi:10.1112/jlms/s1-43.1.152](#)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.