

Trace forms of Galois field extensions in the presence of roots of unity

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A finite field extension L/K gives rise to a quadratic form $x \rightarrow tr(x^2)$ defined over K . This form is called the trace form. It is natural to ask which quadratic forms arise as trace forms of G -Galois extensions (for a given group G). Much research has been done on this question in recent years, in part, because of the connection between trace forms and the extension problem in inverse Galois theory. Describing trace forms over number fields is a rather delicate problem: a complete answer is not known even for cyclic groups of order 16. In this talk I will report on a recent joint result with D.-S. Kang, showing that the situation simplifies considerably if K is assumed to have certain roots of unity.