

On defining the generalized rank weight

Ruud Pellikaan *

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Abstract

This paper investigates four definitions of the generalized rank weight of a code over L , where L is a finite Galois extension of a field K . This is a generalization of the case where $K = \mathbb{F}_q$ and $L = \mathbb{F}_{q^m}$ of Gabidulin codes to arbitrary characteristic as considered by Augot-Loidreau-Robert [1]. Three definitions of the generalized rank weight were already given by Oggier-Sbouï [4], Kurihara-Matsumoto-Uyematsu [3] and Ducoat [2] in case K is a finite field.

This is joint work with Relinde Jurrius.

References

- [1] D. Augot, P. Loidreau, and G. Robert. Rank metric and Gabidulin codes in characteristic zero. In *IEEE ISIT-2013, International Symposium on Information Theory*, pages 509–513, 2013.
- [2] J. Ducoat. Generalized rank weights : duality and Griesmer bound. *CoRR*, arXiv:1306.3899v2, 2013.
- [3] J. Kurihara, R. Matsumoto, and T. Uyematsu. Relative generalized rank weight of linear codes and its applications to network coding. *CoRR*, arXiv:1301.5482v1, 2013.
- [4] F. Oggier and A. Sbouï. On the existence of generalized rank weights. In *ISIT-2012 Proceedings*, pages 4066–410, 2012.

*Email: relinde.jurrius@unine.ch and g.r.pellikaan@tue.nl