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Combinatorics and covering radius of rank-metric error-correcting codes

The covering radius of a rank-metric code is an important parameter that describes its correction capability. It measures the maximum weight of an error matrix than can be corrected by the code.

In this talk we describe combinatorial properties and invariants of matrix codes endowed with the rank metric, and relate them to the covering radius. We introduce new tools for the analysis of rank-metric codes, such as puncturing and shortening constructions. We then discuss upper bounds on the covering radius of a code by applying different combinatorial methods. The various bounds are then applied to the special classes of MRD and quasi-MRD codes.