

Almost all q -matroids are not representable

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The q -analogue of a combinatorial object arises by replacing finite sets with finite dimensional vector spaces. In particular we can view q -matroids as q -analogues of matroids. One motivation to study q -matroids stems from coding theory, as the representable q -matroids arise from rank-metric codes. In the matroidal setting Peter Nelson proved in 2018 that asymptotically almost all matroids are non-representable, therefore one can ask if the same holds true in the q -analogue. In this talk we investigate this question and provide a positive answer to it. For this purpose we give a lower bound on the number of all fixed dimensional q -matroids, using the theory of constant dimension codes and an upper bound on the number of all representable q -matroids, using the concept of zero patterns.

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