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Almost all q-matroids are not representable

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The q-analoge 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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