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Expanding phenomena over higher dimensional matrix rings. (English) Zbl 1469.11040


Summary: In this paper, we study the expanding phenomena in the setting of higher dimensional matrix rings. More precisely, we obtain a sum-product estimate for large subsets and show that $x(y+z), x+yz, xy+z+t$ are moderate expanders over the matrix ring $M_n(\mathbb{F}_q)$.

These results generalize recent results of Y. D. Karabulut et al. [Forum Math. 31, No. 4, 951–970 (2019; Zbl 1462.11023)].

MSC:

11B75 Other combinatorial number theory
11B30 Arithmetic combinatorics; higher degree uniformity
15B33 Matrices over special rings (quaternions, finite fields, etc.)

Keywords:

expanders; sum-product estimates; finite fields

Full Text: DOI arXiv

References:


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