Wei, Hengjia; Schwartz, Moshe
On tilings of asymmetric limited-magnitude balls. (English) Zbl 07453452
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Summary: We study whether an asymmetric limited-magnitude ball may tile $\mathbb{Z}^n$. This ball generalizes previously studied shapes: crosses, semi-crosses, and quasi-crosses. Such tilings act as perfect error-correcting codes in a channel which changes a transmitted integer vector in a bounded number of entries by limited-magnitude errors. A construction of lattice tilings based on perfect codes in the Hamming metric is given. Several non-existence results are proved, both for general tilings, and lattice tilings. A complete classification of lattice tilings for two certain cases is proved.

MSC:
94Bxx Theory of error-correcting codes and error-detecting codes
05Bxx Designs and configurations
52Cxx Discrete geometry

Full Text: DOI

References:

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