Lattice tilings and packings of asymmetric limited-magnitude balls

Hengjia Wei
Peng Cheng Laboratory

Abstract

In this talk, I am going to present some recent results on tilings and packings of asymmetric limited-magnitude balls. These structures are used to construct codes that can correct limited-magnitude errors, which have applications to flash memories and DNA-based data storage. I will give a construction of lattice tilings based on perfect codes in the Hamming metric, and then present several non-existence results, and a complete classification of lattice tilings for two certain cases. As for packings, some constructions with high packing density are given. These results are obtained via various methods, including the use of codes in the Hamming metric, modular B_h-sequences, 2-fold Sidon sets, and sets avoiding arithmetic progression.

E-mail address: hjwei05@163.com