

Rigidity of spherical codes

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One of the classic problems in discrete geometry is the construction of good codes in familiar spaces, such as Euclidean space, spheres, Hamming space, projective spaces, etc. One naturally would like to know whether a given code may be improved by local deformations. Donev, Torquato, Stillinger and Connelly (2004) described a linear programming approach to test for the jamming or rigidity properties of sphere packings in Euclidean space. We describe the analogous algorithm to test for infinitesimal rigidity of codes on spheres. This talk will outline the basic algorithm, and describe some interesting examples in low dimensions. We will describe how the method leads to improvements in some values of kissing numbers. This is based on joint work with Henry Cohn, Yang Jiao and Salvatore Torquato.