RAMANUJAN GRAPHS FROM SIMPLICIAL COMPLEXES WITH FEW BLOCKERS

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Abstract

In this talk, we discuss how to find a construction method for Ramanujan graphs from simplicial complexes with one or two blockers, where blocker mean minimal elements of the complement of a simplicial complex. To obtain this, we completely find all the binary linear codes obtained from simplicial complexes with one or two blockers. Furthermore, we explicitly compute their weight distributions using the corresponding multivariable functions. From the few-weight binary linear codes found, we construct 14 families of nonbipartite Ramanujan graphs; their eigenvalues are computed by using the weight distributions of the corresponding codes. We verify that our families of Ramanujan graphs are different from the previous families in terms of eigenvalues and regularity. This is a joint work with Yoonjin Lee (Ewha Womans University) and Jong Yoon Hyun (Konkuk University).

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