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## High-rate storage codes on triangle-free graphs

Alexander Barg  
University of Maryland  
abarg@umd.edu

### Abstract

Consider an assignment of bits to the vertices of a connected graph  $G(V,E)$  with the property that the value of each vertex is a function of the values of its neighbors. A collection of such assignments is called a storage code of length  $|V|$  on  $G$ . If  $G$  contains many cliques, it is easy to construct codes of rate close to 1, so a natural problem is to construct high-rate codes on triangle-free graphs, where constructing codes of rate  $>1/2$  is a nontrivial task. Previously only isolated examples of storage codes of rate  $\geq 1/2$  on triangle-free graphs were given in the literature. The class of graphs that we consider is coset graphs of linear binary codes (Cayley graphs of the group  $F_2^T$ ). One of the main results of this work is an infinite family of linear storage codes with rate approaching  $3/4$ . We also give a group of necessary conditions for such codes to have rate potentially close to 1 and state a number of open problems. Joint work with Gilles Zémor.