

Generalized Cayley graphs

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For a given group G , an automorphism α of G of order two, and a subset S of G , we define a generalized Cayley graph to be the graph with the vertex set G , and the edge set $\{x, \alpha(x)\mid x \in G\}$. In order to get an undirected graph without loops we add some additional constraints on the set S .

Every Cayley graph is a generalized Cayley graph, but the converse is false. Recently it was proved that there are infinitely many generalized Cayley graphs which are vertex-transitive but not Cayley.

Since for defining a generalized Cayley graph one needs a group automorphism of order two, we will first discuss some properties of such automorphisms, focusing on Abelian groups. We will also discuss the case when this automorphism maps every element of the group to its inverse, and we will characterize the groups for which we can never get a non-Cayley graph using this construction.

This is a joint work with Klavdija Kutnar, Pawel Petecki and Anastasiya Tanana.