

Two new families of non-CCA groups*

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Abstract

We determine two new infinite families of Cayley graphs that admit colour-preserving automorphisms that do not come from the group action. By definition, this means that these Cayley graphs fail to have the CCA (Cayley Colour Automorphism) property, and the corresponding infinite families of groups also fail to have the CCA property. The families of groups consist of the direct product of any dihedral group of order $2n$ where $n \geq 3$ is odd, with either itself, or the cyclic group of order n . In particular, this family of examples includes the smallest non-CCA group that does not fit into any previous family of known non-CCA groups.

Keywords: Cayley graphs, automorphisms, colour preserving, CCA

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Dve novi družini ne-CCA grup*

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Povzetek

Določimo dve neskončni družini Cayleyevih grafov, ki dopuščajo avtomorfizme, ki ohranjajo barve in ne izvirajo iz delovanja grup. Po definiciji to pomeni, da ti Cayleyevi grafi nimajo lastnosti CCA (Cayleyevih barvnih avtomorfizmov), pa tudi ustrezni neskončni družini grup nimata te lastnosti. Ti dve družini grup imata strukturo direktnega produkta poljubne diedrske grupe reda $2n$, kjer je $n \geq 3$ liho število, bodisi s samo seboj bodisi s ciklično grupo reda n . Vsebujeta tudi najmanjšo ne-CCA grupo, ki ne sodi v nobeno od doslej znanih družin teh grup.

Ključne besede: Cayleyevi grafi, avtomorfizmi, ohranjanje barv, CCA

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