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## Cayley Graphs and Symmetric 4-Polytopes

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### Abstract

Previously we have investigated the medial layer graph  $G$  for a finite, self-dual, regular or chiral abstract 4-polytope  $P$ . Here we study the Cayley graph  $C$  on a natural group generated by polarities of  $P$ , show that  $C$  covers  $G$  in a readily computable way and construct  $C$  as a voltage graph over  $G$ . We then examine such symmetric graphs for several interesting families of polytopes of type  $\{p, q, p\}$ ,  $p = 3, 4, 5$ .

**Keywords:** Abstract regular or chiral polytopes, symmetric graphs.

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# Cayleyevi grafi in simetrični 4-politopi

## Povzetek

Doslej smo raziskovali sredinski plastni graf  $G$  končnih, sebi-dualnih, regularnih ali kiralnih abstraktnih 4-politopov  $P$ . Tu raziskujemo Cayleyev graf  $C$  naravne grupe, generirane s polarnostmi politopa  $P$ . Najprej pokažemo, da je  $C$  krov nad  $G$  in da ga zlahka določimo z ustreznim izračunom ter konstruiramo  $C$  kot napetostni graf nad  $G$ . Nato pregledamo takšne simetrične grafe za različne zanimive družine politopov tipa  $\{p, q, p\}$ ,  $p = 3, 4, 5$ .

**Ključne besede:** Abstraktni regularni ali kiralni politopi, simetrični grafi.