ISSN 1855-3966 (printed edn.), ISSN 1855-3974 (electronic edn.)
ARS MATHEMATICA CONTEMPORANEA 23 (2023) #P3.09
https://doi.org/10.26493/1855-3974.2902.f01
(Also available at http://amc-journal.eu)

On adjacency and Laplacian cospectral switching non-isomorphic signed graphs*

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Received 6 June 2022, accepted 2 January 2023, published online 30 January 2023

Abstract

Let $\Gamma = (G, \sigma)$ be a signed graph, where σ is the sign function on the edges of G. In this paper, we use the operation of partial transpose to obtain switching non-isomorphic Laplacian cospectral signed graphs. We will introduce a new operation on signed graphs. This operation will establish a relationship between the adjacency spectrum of one signed graph with the Laplacian spectrum of another signed graph. As an application, this new operation will be utilized to construct several pairs of switching non-isomorphic cospectral signed graphs. Finally, we construct integral signed graphs.

Keywords: Signed graph, partial transpose, cospectral signed graphs, Laplacian cospectral signed graphs, equienergetic signed graphs, integral signed graph.

Math. Subj. Class. (2020): 05C22, 05C50

*The authors are grateful to the referee for the useful comments which improved the presentation of the paper.

†The research of Tahir Shamsher is supported by SRF financial assistance by Council of Scientific and Industrial Research (CSIR), New Delhi, India.

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ISSN 1855-3966 (tiskana izd.), ISSN 1855-3974 (elektronska izd.)
ARS MATHEMATICA CONTEMPORANEA 23 (2023) #P3.09
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(Dostopno tudi na http://amc-journal.eu)

O sosednosti in Laplaceovem kospektralnem preklapljanju med neizomorfnimi predznačenimi grafi*

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Prejeto 6. junija 2022, sprejeto 2. januarja 2023, objavljeno na spletu 30. januarja 2023

Povzetek

Naj bo $\Gamma = (G, \sigma)$ predznačen graf, kjer je σ funkcija, ki vsaki povezavi grafa G priredi njen predznak. V tem članku uporabimo operacijo delnega transponiranja, da dobimo operacijo preklapljanja med neizomorfnimi Laplaceovimi kospektralnimi predznačenimi grafi. Vpeljemo novo operacijo na predznačenih grafih. Ta operacija vzpostavi zvezo med sosednostnim spektrom enega predznačenega grafa z Laplaceovim spektrom nekega drugega predznačenega grafa. Kot primer uporabe, to novo operacijo izkoristimo za konstruiranje več parov, dobljenih s preklapljanjem med neizomorfnimi kospektralnimi predznačenimi grafi. Nazadnje, konstruiramo celoštevilske predznačene grafe.

Ključne besede: Predznačeni graf, delno transponiranje, kospektralni predznačeni grafi, Laplaceovi kospektralni predznačeni grafi, ekvienergetski predznačeni grafi, celoštevilski predznačeni graf.

Math. Subj. Class. (2020): 05C22, 05C50

*Avtorja sta hvaležna recenzentu za koristne pripombe, ki so izboljšale strukturo članka.

†Raziskava Tahirja Shamsherja je podprta s finančno asistenco SRF s strani Council of Scientific and Industrial Research (CSIR), New Delhi, India.

‡Kontaktni avtor. Raziskava S. Pirzade je podprta s strani raziskovalnega projekta SERB-DST številka CRG/2020/000109.

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