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Distance spectrum of graph compositions

Gopalapillai Indulal

Abstract

The D -eigenvalues $\{\mu_1, \mu_2, \dots, \mu_p\}$ of a graph G are the eigenvalues of its distance matrix D and form the distance spectrum or D -spectrum of G denoted by $spec_D(G)$. In this paper we obtain the D -spectrum of the cartesian product of two distance regular graphs. The D -spectrum of the lexicographic product $G[H]$ of two graphs G and H when H is regular is also obtained. The D -eigenvalues of the Hamming graphs $Ham(d, n)$ of diameter d and order n^d and those of the C_4 nanotori, T_{k,m,C_4} are determined.

Keywords: Distance spectrum, Cartesian product, lexicographic product, Hamming graphs, C_4 nanotori.

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Razdaljni spekter grafovskih kompozicij

Povzetek

D -lastne vrednosti $\{\mu_1, \mu_2, \dots, \mu_p\}$ grafa G so lastne vrednosti njegove razdaljne matrike D in tvorijo razdaljni spekter oziroma D -spekter grafa G , ki ga označimo $spec_D(G)$. V tem članku določimo D -spekter kartezičnega produkta dveh razdaljno regularnih grafov. Prav tako določimo D -spekter leksikografskega produkta $G[H]$ grafov G in H v primeru, ko je H regularen. Določimo tudi D -lastne vrednosti Hammingovih grafov $Ham(d, n)$ premera d in reda n^d ter C_4 nanosvitkov, označenih T_{k,m,C_4} .

Ključne besede: Razdaljni spekter, kartezični produkt, leksikografski produkt, Hammingovi grafi, C_4 nanosvitki.