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Spectrum, distance spectrum, and Wiener index of wreath products of complete graphs

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Abstract: We describe the adjacency matrix and the distance matrix of the wreath product of two complete graphs, and we give an explicit computation of their spectra. As an application, we deduce the spectrum of the transition matrix of the Lamplighter random walk over a complete base graph, with a complete color graph. Finally, an explicit computation of the Wiener index is given.

Keywords: Wreath product of complete graphs, adjacency matrix, distance matrix, spectrum, distance spectrum, Wiener index.

Math. Subj. Class.: 05C12, 05C50, 05C76, 05C81, 15A69

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Spekter, razdaljni spekter in Wienerjev indeks venčnih produktov polnih grafov

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Povzetek: Opišemo matriko sosednosti in razdaljno matriko venčnega produkta dveh polnih grafov in podamo ekspliciten izračun njunih spektrov. Kot primer uporabe izpeljemo spekter prehodne matrike Lamplighterjevega naključnega sprehoda nad polnim osnovnim grafom s polnim barvnim grafom. Podamo tudi ekspliciten izračun Wienerjevega indeksa.

Ključne besede: Venčni produkt polnih grafov, matrika sosednosti, razdaljna matrika, spekter, razdaljni spekter, Wienerjev indeks.

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