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ON SPECTRA OF EXPANSION GRAPHS AND MATRIX POLYNOMIALS, II*

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Abstract. An expansion graph of a directed weighted graph G_0 is obtained from G_0 by replacing some edges by disjoint chains. The adjacency matrix of an expansion graph is a partial linearization of a matrix polynomial with nonnegative coefficients. The spectral radii for different expansion graphs of G_0 and correspondingly the spectral radii of matrix polynomials with nonnegative coefficients, which sum up to a fixed matrix, are compared. A limiting formula is proved for the sequence of the spectral radii of a sequence of expansion graphs of G_0 when the lengths of all chains replacing some original edges tend to infinity. It is shown that for all expansion graphs of G_0 the adjacency matrices have the same level characteristic, but they can have different height characteristics as examples show.

Key words. Expansion graph, Matrix polynomial, Graph spectrum, Height characteristic, Level characteristic.

AMS subject classifications. 05C50, 15A22, 15A42, 05C20

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