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TIGHT BOUNDS ON THE ALGEBRAIC CONNECTIVITY OF A BALANCED BINARY TREE*

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Abstract. In this paper, quite tight lower and upper bounds are obtained on the algebraic connectivity, namely, the second-smallest eigenvalue of the Laplacian matrix, of an unweighted balanced binary tree with k levels and hence $n = 2^k - 1$ vertices. This is accomplished by considering the inverse of a matrix of order $k-1$ readily obtained from the Laplacian matrix. It is shown that the algebraic connectivity is $1/(2^k - 2k + 3) + O(1/2^{2k})$.

Key words. Binary trees, Laplacian matrix, Algebraic connectivity

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