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A Further Study on the 4-Ordered Property of Some Chordal Ring Networks

Authors : Shin-Shin Kao, Hsiu-Chunj Pan

Abstract : Given a graph G. A cycle of G is a sequence of vertices of G such that the first and the last vertices are the same. A hamiltonian cycle of G is a cycle containing all vertices of G. The graph G is k-ordered (resp. k-ordered hamiltonian) if for any sequence of k distinct vertices of G, there exists a cycle (resp. hamiltonian cycle) in G containing these k vertices in the specified order. Obviously, any cycle in a graph is 1-ordered, 2-ordered and 3-ordered. Thus the study of any graph being k-ordered (resp. k-ordered hamiltonian) always starts with k = 4. Most studies about this topic work on graphs with no real applications. To our knowledge, the chordal ring families were the first one utilized as the underlying topology in interconnection networks and shown to be 4-ordered [1]. Furthermore, based on computer experimental results in [1], it was conjectured that some of them are 4-ordered hamiltonian. In this paper, we intend to give some possible directions in proving the conjecture.

Keywords : Hamiltonian cycle, 4-ordered, Chordal rings, 3-regular
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