DECOMPOSITION OF THE PRODUCT OF CYCLES BASED ON DEGREE PARTITION

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Abstract

The Cartesian product of $n$ cycles is a $2n$-regular, $2n$-connected and bipancyclic graph. Let $G$ be the Cartesian product of $n$ even cycles and let $2n = n_1 + n_2 + \cdots + n_k$ with $k \geq 2$ and $n_i \geq 2$ for each $i$. We prove that if $k = 2$, then $G$ can be decomposed into two spanning subgraphs $G_1$ and $G_2$ such that each $G_i$ is $n_i$-regular, $n_i$-connected, and bipancyclic or nearly bipancyclic. For $k > 2$, we establish that if all $n_i$ in the partition of $2n$ are even, then $G$ can be decomposed into $k$ spanning subgraphs $G_1, G_2, \ldots, G_k$ such that each $G_i$ is $n_i$-regular and $n_i$-connected. These results are analogous to the corresponding results for hypercubes.

Keywords: hypercube, Cartesian product, $n$-connected, regular, bipancyclic, spanning subgraph.

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References


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