

1067-05-2029

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53706. *ϕ -Symmetric Hamilton Cycle Decompositions of Graphs*. Preliminary report.

Let G be a graph on n vertices. Let ϕ be a non-trivial vertex automorphism of G . A ϕ -symmetric Hamilton cycle decomposition of G is a Hamilton cycle decomposition of G for which each Hamilton cycle is fixed (as an edge set) by ϕ . We will discuss recent results involving complete multi-partite graphs and automorphisms of degree larger than 2. (Received September 22, 2010)