ON UNIQUENESS OF PACKING OF TWO AND THREE COPIES OF 2-FACTORS

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An *embedding* of a graph G, of order n, (in its complement $\overline{G}$) is a permutation σ on $V(G)$ such that if an edge xy belongs to $E(G)$, then $\sigma(x)\sigma(y)$ does not belong to $E(G)$. In others words, an embedding is an (edge-disjoint) *packing* of two copies of G into a complete graph K_n. At first we will consider the problem of the uniqueness of such packings of two copies. Two such embeddings σ_1, σ_2 of a graph G are said to be *distinct* if the graphs $G \oplus \sigma_1(G)$ and $G \oplus \sigma_2(G)$ are not isomorphic (for graphs G_1 and G_2 with $V(G_1) = V(G_2)$ and $E(G_1) \cap E(G_2) = \emptyset$ the *edge sum* $G_1 \oplus G_2$ has $V(G) = V(G_1) = V(G_2)$ and $E(G) = E(G_1) \cup E(G_2)$). A graph G is called *uniquely embeddable* if for all embeddings σ of G, all graphs $G \oplus \sigma(G)$ are isomorphic.

Let $C_{n_1} \cup C_{n_2} \cup \ldots \cup C_{n_k}$ be a 2-factor *i.e.* a vertex-disjoint union of cycles. We completely characterize 2-factors *i.e.* we prove which 2-factors do not have packing of two copies, which have unique packing of two copies and which have at least two distinct of two copies. During this talk some prove ideas will be presented. Moreover we present the generalization of this problem into the problem of the uniqueness of packing of three copies of 2-factors and give the solution of it.