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Sequentially Perfect 1-Factorization and Cycle Structure of Patterned Factorization of K_{2^n}

In this paper, a new method to construct a 1-factorization of a complete graph of order 2^n is proposed. Novelty of the method is that the 1-factorization that it produces is sequentially perfect and is at times perfect. Also, a set of 1-factors of the 1-factorization are always pairwise perfect. These perfect pairs can be identified using the gcd computation. The paper also analyzes the cycle structure of the patterned 1-factorization via the proposed 1-factorization.