

On Decompositions of the Complete 4-Uniform Hypergraph into 4-Colorable 3-cycles

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The complete t -uniform hypergraph of order v , denoted $K_v^{(t)}$, has a set V of size v as its vertex set and the set of all t -element subsets of V as its edge set. For the purposes of this work, we define a 4-uniform 3-cycle to be any hypergraph that can be obtained by adding 2 vertices to each edge in $K_3^{(2)}$. Two such 3-cycles have chromatic number 4. We give necessary and sufficient conditions for the existence of decompositions of $K_v^{(4)}$ into these 4-colorable 3-cycles.

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