

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 4-uniform hypergraph of maximum degree 2 that can be obtained by adding two vertices to each of the 3 edges in $K_3^{(2)}$. Two such 4-uniform 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.

This work was completed at the *Illinois State University REU for Pre-service and In-service Teachers* under the direction of Ryan Bunge, Saad El-Zanati and William F. Turner.

Keywords: 4-uniform hypergraphs, hypergraph decompositions, 4-colorable cycles