On decompositions of complete 4-uniform hypergraphs into a 2-regular 4-cycle

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The complete 4-uniform hypergraph of order v has a set V of size v as its vertex set and the set of all 4-element subsets of V as its edge set. An example of a 2-regular 4-cycle in such a hypergraph has vertex set $\{a, b, c, d, e, f, g, h\} \subseteq V$ and edge set $\{\{a, b, c, d\}, \{c, d, e, f\}, \{e, f, g, h\}, \{g, h, a, b\}\}$. In this talk, we give necessary and sufficient conditions for the existence of a decomposition of the complete 4-uniform hypergraph of order v into isomorphic copies of this 2-regular 4-cycle.
This is joint-work with Ryan Bunge, Dontez Collins, Saad El-Zanati, Cole Gaskins, Joel Jeffries, Camryn Keaton, Mariyem Mrani, and Beth Warden.

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