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Cycle systems of the complete multipartite graph

An ℓ -cycle system of a graph Γ is a set of ℓ -cycles of Γ whose edges partition the edge set of Γ ; is it *regular* if there is an automorphism group G of Γ acting regularly on the vertices of Γ and permuting the cycles, *cyclic* if G is cyclic.

When Γ is $K_m[n]$, the complete multipartite graph with m parts each of size n , the existence problem for ℓ -cycle systems is not completely solved, and little is known on regular systems. We discuss new existence results for cycle systems of $K_m[n]$, concentrating mostly on cyclic systems.