Even Cycle Systems Without Parallel Classes

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(joint work with Peter Danziger and Eric Mendelsohn)

A $2t$-cycle system of even order v is a set $\mathcal{C}$ of cycles whose edges partition the edge-set of $K_v - I$ (i.e., the complete graph minus the 1-factor I). If $v \equiv 0 \pmod{2t}$, a set of $v/2t$ vertex-disjoint cycles of $\mathcal{C}$ is a parallel class.

We show that there exists a $2t$-cycle system of order $v \equiv 0 \pmod{2t}$ without parallel classes if and only if $v > 2t > 2$.