On Disjoint Cycles and Degree Conditions

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The minimum degree sum over all sets of t independent vertices in a graph G is denoted $\sigma_t(G)$. We prove that if a graph G has order at least $7k+1$ and $\sigma_4(G) \geq 8k-3$, with $k \geq 2$, then G contains k vertex-disjoint cycles. We also show that the degree sum condition is sharp and conjecture a degree sum condition $\sigma_t(G)$ for any fixed $t \geq 2$ sufficient to imply G contains k vertex-disjoint cycles for $k \geq 2$.

Keywords: degree sum, vertex-disjoint cycles