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A Recursive Approach to the Two-fold Oberwolfach Problem

The Oberwolfach problem OP$(m_1, \ldots, m_k)$ asks whether there is a decomposition of K_n into isomorphic 2-factors that are each isomorphic to a union of disjoint cycles of given lengths $m_1, \ldots, m_k$. A variant of the problem is the two-fold Oberwolfach problem OP$_2(m_1, \ldots, m_k)$, which asks for similar decompositions of the two-fold complete graph $2K_n$. The two-fold problem has been solved for some cases, including the uniform case with all equal cycle lengths, the case where each factor has two cycles, and the case where all cycle lengths are even, but in general the problem is still open. In this talk, we use a recursive approach to construct solutions to infinite families of larger cases of OP$_2$ from existing solutions to smaller cases of OP$_2$.