Frattini-based starters in 2–groups.
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Let $G$ be a finite group of even order $v$. Does there exist a 1–factorization of $K_v$ admitting $G$ as an automorphism group acting sharply transitively on vertices? If $G$ is cyclic and $v = 2^t$, for $t \geq 3$, then the answer to the previous question is known to be negative by a result of A.Hartman and A.Rosa (1985). For several large families of groups of even order constructions have always been found thus far. Nonexistence results have only been obtained in special cases under extra assumptions on the action of $G$ on the 1–factors, typically the existence of fixed one-factors or that the number of fixed one-factors is as large as possible. In this talk we address these questions and we present a construction in the case where $G$ is a 2–group using the Frattini subgroup $\Phi(G)$, the intersection of all maximal subgroups of $G$. 