On Decomposing Regular Graphs and Multigraphs into Isomorphic Trees and Forests

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Let $H$ and $G$ be graphs or multigraphs such that $G$ is a subgraph of $H$. A $G$-decomposition of $H$ is a set $\Delta = \{G_1, G_2, \ldots, G_t\}$ of pairwise edge-disjoint subgraphs of $H$ each of which is isomorphic to $G$ and such that each edge of $H$ occurs in exactly one $G_i$. Graham and Häggkvist have conjectured that every tree with $n$ edges decomposes every $2n$-regular graph. This conjecture has been confirmed for a small number of cases. We believe the Graham and Häggkvist Conjecture extends to forests with $n$ edges. We have also recently conjectured that every tree with $n$ edges decomposes every $2n$-regular multigraph with edge multiplicity at most 2. In this talk, we report on some recent results related to variations of these conjectures.