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Achieving excesses and leaves: packings and coverings of complete graphs with small trees

A well known result in combinatorial designs characterizes the leaves and excesses of maximum packings and minimum coverings of the complete graph with triangles in those cases where a decomposition is not possible. Similar work was done by Roditty in the 1980s for trees with few edges. However, unlike the triangle case, with trees, the leaves (excesses) may vary greatly. For trees with at most 5 edges, we achieve all leaves and excesses of maximum packings and minimum coverings. Joint work with Sadegheh Haghshenas and Nabil Shalaby.