TURÁN NUMBERS OF MULTIPLE PATHS AND EQUIBIPARTITE TREES

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Abstract. The Turán number of a graph $H$ is the maximum number of edges in any graph on $n$ vertices which does not contain $H$ as a subgraph. Let $P_l$ denote a path on $l$ vertices, and $k \cdot P_l$ denote $k$ vertex disjoint copies of $P_l$. We first determine $\text{ex}(n, k \cdot P_3)$, answering in the positive a conjecture of Gorgol. Further, we determine $\text{ex}(n, k \cdot P_l)$ for arbitrary $l$, and $n$ appropriately large relative to $k$ and $l$. We provide a some background on the famous Erdős-Sós conjecture, and conditional on its truth we obtain tight bounds on $\text{ex}(n, H)$ when $H$ is a forest consisting of equibipartite trees, for appropriately large $n$. This is joint work with Nathan Kettle at the University of Cambridge.

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