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On 1-subdivision of transitive tournaments

Monday, 20 December 2021 17:30 (25 minutes)

The oriented Ramsey number $\vec{r}(H)$ for an acyclic digraph H is the minimum integer n such that any n-vertex tournament contains a copy of H as a subgraph. We prove that the 1-subdivision of the k-vertex transitive tournament H_k satisfies $\vec{r}(H_k) \leq O(k^2 \log \log k)$. This is tight up to multiplicative $\log \log k$-term.

We also show that if T is an n-vertex tournament with $\Delta^+(T) - \delta^+(T) \leq O(n/k) - k^2$, then T contains a 1-subdivision of $\vec{K}_k$, a complete k-vertex digraph with all possible $k(k-1)$ arcs. This is also tight up to multiplicative constant.

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