

Transitive tournament tilings in oriented graphs with large total degree

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An orientation of a simple graph is called an oriented graph, and an orientation of the complete graph is called a transitive tournament if it does not contain a directed cycle. In this talk, we will investigate the minimum degree threshold for oriented graphs on $n = mk$ vertices to contain a collection of m vertex-disjoint copies of the transitive tournament on k vertices.

As observed by Yuster, for $k = 3$, the Hajnal-Szemerédi Theorem implies that $\frac{5n}{6}$ is the correct minimum degree threshold. For $k = 4$, we will show that the asymptotically correct minimum degree threshold is $\left(\frac{11}{12} + o(1)\right)n$. We will also discuss a number of related conjectures and results.

Joint work with Louis DeBiasio, Allan Lo, and Andrew Treglown