Guangzhou Discrete Mathematics Seminar

Vertex degree sums for perfect matchings in 3-uniform hypergraphs

Yan Wang

Shanghai Jiao Tong University, Shanghai, China

8 December 2023 (Friday), 4:30pm to 5:30pm
Room 416, School of Mathematics, Sun Yat-sen University
Tencent meeting ID: 788 084 519

Let $H^2_{n,n/3}$ be the 3-graph of order n, whose vertex set is partitioned into two sets S and T of size $\frac{1}{3}n+1$ and $\frac{2}{3}n-1$, respectively, and whose edge set consists of all triples with at least 2 vertices in T. Suppose that n is sufficiently large and H is a 3-uniform hypergraph of order n with no isolated vertex. Zhang and Lu [Discrete Math. 341 (2018), 748–758] conjectured that if $\deg(u)+\deg(v) > 2(\binom{n-1}{2}-\binom{2n/3}{2})$ for any two vertices u and v that are contained in some edge of H, then H contains a perfect matching or H is a subgraph of $H^2_{n,n/3}$. We construct a counter-example to the conjecture. Furthermore, we prove that if $\deg(u)+\deg(v) > (\frac{3}{5}+c)n^2$ for any two vertices u and v that are contained in some edge of H, then H contains a perfect matching or H is a subgraph of $H^2_{n,n/3}$. This result implies a result of Zhang, Zhao and Lu [Electron. J. Combin. 25 (3), 2018]. This is joint work with Yi Zhang.

Guangzhou Discrete Mathematics Seminar
Website `http://www.gzdmseminar.cn`
Mirror site `http://www.cantab.net/users/henry.liu/gzdmseminar.htm`

QR code of the seminar series