Edge-connectivity and the number of pairwise disjoint perfect matchings in r-graphs

Isaak H. Wolf (Paderborn University)

For each integer $r \geq 2$, an r-graph is an r-regular graph in which every odd set of vertices is connected by at least r edges to its complement. In the past years, much research about structural properties of r-graphs has been done. In particular, factors and perfect matchings of such graphs were studied; many problems remain unsolved. We focus on the relation between the edge-connectivity and the number of pairwise disjoint perfect matchings in r-graphs.

For $0 \leq \lambda \leq r$ let $m(\lambda, r)$ be the maximum number s such that every λ-edge-connected r-graph has s pairwise disjoint perfect matchings. There are only a few values of $m(\lambda, r)$ known, for instance $m(3,3) = m(4,r) = 1$, and $m(r,r) \leq r-2$ for all $r \neq 5$, and $m(r,r) \leq r-3$ if r is a multiple of 4. In this talk, some upper bounds for $m(\lambda, r)$ will be presented. Furthermore, we discuss relations between the value of $m(5,5)$ and some well-known conjectures for cubic graphs.

This talk is based on a joint work with Yulai Ma, Davide Mattiolo and Eckhard Steffen.

Isaak H. Wolf
Department of Mathematics
Paderborn University
Warburger Str. 100
33098 Paderborn
isaak.wolf@upb.de