Combinatorics Seminar

Friday, Nov. 15, 2013

2:00 pm in Hume 331

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Hamiltonian cycles through a given edge of more than 1-tough chordal planar graphs

ABSTRACT

A graph is said to be planar if G may be configured in the plane without edge crossings and is chordal if G has no induced cycles of size greater than 3. A graph G is hamiltonian if there is a cycle that passes through all vertices of G, a hamiltonian cycle. In 1999, Böhme et al. showed the every chordal planar graph with toughness exceeding 1 is hamiltonian.

The generalized tree, the k-tree is defined recursively as follows: (i) The smallest k-tree is the k-clique K_k. (ii) For $n \geq k$, if T_n^k is a k-tree with n vertices and a new vertex v of degree k is added and joined to the vertices of a k-clique in T_n^k, then the larger graph is a k-tree with $n+1$ vertices. In this presentation, we define tree-like k-trees, a subclass of k-trees. Chordal planar graphs with toughness exceeding 1 are all shown to be tree-like 3-trees with toughness exceeding 1, and from the perspective of tree-like 3-trees, we strengthen the result of Böhme et al. mentioned above by showing that every edge of a more than 1-tough tree-like 3-tree is contained in a hamiltonian cycle.

This is joint work with W. Staton and B. Wei.