Packing Complete Bipartite Graphs with Cycles

Catharine Baker
Mount Allison University
cbaker@mta.ca

(joint work with Elizabeth Billington, University of Queensland)

In 1981, Sotteau determined the necessary and sufficient conditions for decomposing a complete bipartite graph, $K_{m,n}$, into $2k$-cycles. In the case where m and n don't meet these criteria, any attempt to decompose $K_{m,n}$ into $2k$-cycles will result in a set of leftover edges, $E(L)$. A *maximal packing* consists of such a set of non-intersecting $2k$-cycles in $K_{m,n}$ for which $| E(L) |$ is minimal. Some of the cases where k is small have been considered by a number of authors. We determine necessary conditions for maximal packings and show that in certain cases these conditions are also sufficient.

MSC2000: 05C70.

Keywords: graph packing, complete bipartite graph.

.