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Maria Chudnovsky* (mchudnov@columbia.edu), Department of IEOR, Columbia University, New York, NY 10027, and **Paul D Seymour** (pds@math.princeton.edu), Department of Mathematics, Princeton University, Princeton, NJ 08544. *Even pairs in perfect graphs.*

An even pair in a graph is a pair of non-adjacent vertices so that every induced path between them has even length. A graph is called *Berge* if no induced subgraph of it is a cycle of odd length at least five or the complement of one. In my talk I will discuss two results, obtained in joint work with Paul Seymour, about even pairs in Berge graphs.

The first result is a simplification of the proof of the Strong Perfect Graph Theorem (which we proved a few years ago in joint work with Neil Robertson, Paul Seymour and Robin Thomas). We were able to replace the last 55 pages of the proof (which are the least intuitive part of it) with a much shorter and simpler argument. This simplification is based on an approach by Maffray and Trotignon that allowed us to find even pairs in certain classes of Berge graphs.

The second result is a description of all K_4 -free Berge graphs that do not have even pairs. This is a special case of a conjecture of Thomas, attempting to describe all Berge graphs with no even pair. In particular, our result implies a new combinatorial coloring algorithm for K_4 -free Berge graphs. (Received January 18, 2008)