The optimal path–matching problem

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(joint work with J.F. Geelen)

Let T_1 and T_2 be disjoint subsets of vertices of a graph G, each of size k. A *perfect path-matching* of G is a set of k vertex-disjoint paths from T_1 to T_2, together with a perfect matching of the vertices not in any path. (In the case where the T_i are empty, it is just a perfect matching of G.) We give generalizations to path-matchings of many of the important results of matching theory. We also give applications of these results, including computing the rank of a certain matrix of indeterminates. Finally, we indicate how the results can be further generalized to include matroid intersection as a special case.