1023-D1-128   **Maren Martens*** (`maren.martens@math.uni-dortmund.de`), FB Mathematik, LSV, Vogelpothsweg 87, 44227 Dortmund, Germany, and **Martin Skutella**. *Network Flow Problems with Path Capacities.* Preliminary report.

In this talk we study a problem from combinatorial optimization. For the following flow problem in networks with capacities on the arcs we consider the single commodity as well as the multicommodity case: Find a maximum flow specified by a feasible assignment of flow values to simple paths subject to the constraint that no path carries more than one unit of flow. In contrast to the classical maximum flow problem (with no restriction on the path flows) this problem is NP-hard and there are even single-source single-sink networks with integral arc capacities for which there exists no integral optimal solution.

We present NP-hardness results and approximation algorithms for the fractional as well as the integral problem. While there exists an FPTAS in the fractional case, the integral problem is even hard to approximate. Further, we describe some interesting problems from combinatorial optimization that are closely related to the considered problem. (Received August 04, 2006)