

Strong formulations for mixed integer quadratic modeling MIQM

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Abstract. Frequently, MIQM is required in multi horizon optimization models that arise in system design and expansion in a variety of problems. Given a set of periods, let us name them stages, the variables are related to strategic decisions on the system infrastructure in the stages, and operational decisions in the time periods within the stages. Let S denote the set of stages and T_s the set of time periods in stage s , so that MIQM can be expressed as $y_t \leq x_s$, for t in T_s , s in S , where y_t is a bounded variable, and x_s is an integer one. The commercial optimizers use to replace the MIQMs with Fortet (also known as McCormick) inequalities usually without considering other constraints as the frequent tool related to the x -special ordered set S1. In this talk several MILP reformulations of MIQM are considered for the so-named impulse modeling object as well as for its counterpart step variable one, presenting the strength of several modeling alternatives.