

Verified Numerical Computations in Convex Programming and Applications

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Abstract—Mathematical models of real world situations in any case are incomplete. They are flexible to some extent, and frequently this flexibility can be used to build a tractable convex model, yielding a large variety of applications. Also for global and mixed-integer problems convex optimization provides the integral part of deterministic methods. In this talk verified forward error bounds for the optimal value of convex optimization problems as well as verified certificates of infeasibility are presented, including the discussion of rounding-off errors. The underlying vector spaces are not required to be finite-dimensional, i.e. the bounds are developed in the framework of functional analysis. Numerical results for several applications and the software package VSDP are presented.