

The Structured Singular Value (SSV) provides a powerful tool to test robust stability and performance of feedback systems subject to structured uncertainties. Unfortunately, computing the SSV is an NP-hard problem, and the polynomial-time algorithms available in the literature are only able to provide, except for some special cases, upper and lower bounds on the exact value of the SSV. In this work, we present a new algorithm to compute an upper bound on the SSV in case of mixed real/complex uncertainties. The underlying idea of the developed approach is to formulate the SSV computation as a (nonconvex) polynomial optimization problem, which is relaxed into a sequence of convex optimization problems through moment-based relaxation techniques. Two heuristics to compute a lower bound on the SSV are also discussed. The analyzed numerical examples show that the developed approach provides tighter bounds than the ones computed by the algorithms implemented in the Robust Control Toolbox in Matlab, and it provides, in most of the cases, coincident lower and upper bounds on the structured singular value.