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"An elementary recursive bound for the Positivstellensatz"

Abstract:

Given a system of multivariate polynomial equations and inequalities with no solution over the real numbers, the Positivstellensatz states the existence of an algebraic identity which makes evident this fact. In this talk, we present a new constructive proof of the Positivstellensatz, and show that following this construction, the degree of the polynomials in the identity is bounded by an elementary recursive function in the number of variables, the number of polynomials in the system and the degree of these polynomials. As an application, we obtain that the same kind of bound holds for Hilbert 17 problem.