Solving Polynomial Optimization Problems via the Truncated Tangency Variety and Sums of Squares

H. H. Vui[1] and <u>P. T. Son</u>[2]

Abstract: This paper proposes a method for finding the global infimum of a polynomial f on an semialgebraic set S via sum of squares relaxation over its truncated tangency variety, even in the case where the polynomial f does not attain its infimum on S: Under a constraint qualification condition, it is demonstrated that: (i) The infimum of f on S and on its truncated tangency variety coincide; and (ii) A sums of squares certificate for nonnegativity of f on its truncated tangency variety. These facts imply that we can find a natural sequence of semidefinite programs whose optimal values converges monotonically increasing to the infimum of f on S.

[1] Institute of Mathematics
Vietnamese Academy of Science and Technology
18 Hoang Quoc Viet Road, Cau Giay District
10307 Hanoi, Vietnam
hhvui@math.ac.vn

[2] Department of Mathematics, University of Da Lat
Da Lat, Vietnam
pham_ts@yahoo.co.uk