

Solving bivariate truncated moment problems by reduction to the univariate setting

Aljaž Zalar (University of Ljubljana, Ljubljana, Slovenia)

Given a finite d -dimensional real multisequence β indexed by monomials in d variables of total degree k and a closed set K of \mathbb{R}^d , the truncated moment problem (K -TMP) on K asks to characterize the existence of a positive Borel measure μ on \mathbb{R}^d with support in K such that the elements of β are the moments of μ . In this talk we will present a technique for reducing some bivariate TMPs to the truncated univariate setting with all elements up to a certain degree known or with some gaps in the sequence. In the first case one can apply the solution to the corresponding univariate TMP, while the second case corresponds to the matrix completion problem, where the completion must be a Hankel matrix and satisfies the conditions in the solution to the corresponding univariate TMP. Using this approach we obtain alternative proofs of some existing results on the TMP, mainly due to Curto and Fialkow, but also solve new cases to the TMP on cubic curves and on special cases of higher degree curves. Moreover, the same technique can be applied for solving the bivariate matrix and tracial TMPs.