Lawrence Fialkow

SUNY New Paltz

The core variety of a multisequence in the truncated moment problem

Abstract

Let K denote a nonempty closed subset of $\mathbb{R}^n$, let $m = 2d$, and let $\beta \equiv \beta^{(m)} = \{\beta_i\}_{i \in \mathbb{Z}_+^n, |i| \leq m}$, $\beta_0 > 0$, denote a real n-dimensional multisequence of finite degree m. *The Truncated K-Moment Problem* concerns the existence of a positive Borel measure μ, supported in K, such that

$$\beta_i = \int_{\mathbb{R}^n} x^i d\mu \qquad (i \in \mathbb{Z}_+^n, \quad |i| \leq m).$$

The *core variety* of β, $\mathcal{V} \equiv \mathcal{V}(\beta)$, is an algebraic variety in $\mathbb{R}^n$ that contains the support of any such *K-representing measure*. In previous work we showed, conversely, that if $\mathcal{V}$ is a nonempty compact set, or $\mathcal{V}$ is nonempty and is a determining set for polynomials of degree at most m (in particular, if $\mathcal{V} = \mathbb{R}^n$), then β admits a $\mathcal{V}$-representing measure. We describe some additional cases where a nonempty core variety implies the existence of a representing measure.

Talk time: 07/19/2016 2:30PM— 07/19/2016 2:50PM
Talk location: Crow 206

Special Session: Multivariable operator theory. Organized by H. Woerdeman.