

1077-47-758

David P Kimsey and **Hugo J Woerdeman*** (hugo@math.drexel.edu), Department of Mathematics, Drexel University, 3141 Chestnut Street, Philadelphia, PA 19104. *The truncated matrix valued multivariable K -moment problem.*

The matrix-valued truncated K -moment problem on \mathbb{R}^d requires necessary and sufficient conditions for a multisequence of Hermitian matrices $\{S_\gamma\}_{\gamma \in \Gamma}$, where Γ is a finite subset of \mathbb{N}_0^d , to be the corresponding moments of a positive matrix-valued Borel measure σ and also the support of σ must lie in some given non-empty set $K \subseteq \mathbb{R}^d$, i.e.

$$S_\gamma = \int_{\mathbb{R}^d} \xi^\gamma d\sigma(\xi), \quad \gamma \in \Gamma, \tag{1}$$

and

$$\text{supp } \sigma \subseteq K. \tag{2}$$

In this paper we obtain necessary and sufficient conditions for the existence of a finitely atomic measure which satisfies (1) and (2). In particular, our result can handle the case when the indexing set that corresponds to the powers of total degree at most $2n + 1$. We will also discuss a similar result in the complex setting. (Received September 14, 2011)