# The Truncated Moment Problem for Unital Commutative $\mathbb{R}$-Algebras

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## Abstract

Let $A$ be a unital commutative $\mathbb{R}$-algebra, $K$ a closed subset of the character space of $A$, and $B$ a linear subspace of $A$. For a linear functional $L : B \to \mathbb{R}$, we investigate conditions under which $L$ admits an integral representation with respect to a positive Radon measure supported in $K$. When $A$ is equipped with a submultiplicative seminorm, we employ techniques from the theory of positive extensions of linear functionals to prove a criterion for the existence of such an integral representation for $L$. When no topology is prescribed on $A$, we identify suitable assumptions on $A$, $K$, $B$ and $L$ which allow us to construct a seminormed structure on $A$, so as to exploit our previous result to get an integral representation for $L$.

Our main theorems allow us to extend some well-known results on the Classical Truncated Moment Problem, the Truncated Moment Problem for point processes, and the Subnormal Completion Problem for 2–variable weighted shifts. We also analyze the relation between the Full and the Truncated Moment Problem in our general setting; we obtain a suitable generalization of Stochel's Theorem, which readily applies to Full Moment Problems for localized algebras.

The talk is based on joint work with Mehdi Ghasemi, Maria Infusino, and Salma Kuhlmann.

**Keywords:** truncated moment problem, full moment problem, measure, integral representation, linear functional.