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L^1-approximation with constraints.

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Let K denote a compact subset of $\mathbf{R}^n$ $(n \geq 1)$ satisfying $K = \overline{\operatorname{int} K}$, and $C(K)$ the space of all real-valued continuous functions defined on K. Assume that μ is any nonatomic positive finite measure on K such that every $f \in C(K)$ is μ-measurable and $\|f\|_1 := \int_K |f(x)| d\mu(x)$ is a norm on $C(K)$. Let $C_1(K, \mu)$ denote the space $C(K)$ endowed with the norm $\|\cdot\|_1$. If U is a finite-dimensional subspace of $C_1(K, \mu)$, and M a closed convex subset of U, then every $f \in C_1(K, \mu)$ has a best $L_1(K, \mu)$-approximation from M.

The authors consider problems of characterization and uniqueness of best $L_1(K, \mu)$-approximations to functions $f \in C_1(K, \mu)$ from M, where M may or may not depend on f. In particular, they consider the problem of bounded coefficient approximation, the problem of best restricted range approximation, and best approximation under interpolatory constraints. Moreover they give applications to restricted range and derivative approximation. *Manfred Sommer* (Eichstätt)