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FINITELY GENERATED PROJECTIVE EXTENSIONS OF UNIFORM ALGEBRAS

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Let A and B be uniform algebras and suppose that B is an extension of A, finitely generated and projective as an A-module. Let π denote the natural projection from the maximal ideal space of B onto the maximal ideal space of A. We show that K is a generalized peak interpolation set for B if and only if $\pi(K)$ is a generalized peak interpolation set for A. Then we give a topological description of the maximals sets of antisymmetry of B in terms of those of A. Finally, we prove that if B is strongly separable over A, then the algebra of B-holomorphic functions is strongly separable over the algebra of A-holomorphic functions.

1. Introduction. The main motivation for this work comes from a series of results discovered over the last twenty years concerning the structure of certain types of integral extensions of (commutative complex unital) Banach algebras. More precisely, the results which we are refering to group roughly in two classes. On one hand, we have the theory of the so-called algebraic or Arens-Hoffman extensions [1, 2, 7, 8]. These are extensions of the form $A[x]/(\alpha(x))$, where $\alpha(x)$ is a monic polynomial with coefficients in the base algebra A. Moreover, part of this theory was recently extended [12] to the case where the extension is finitely generated and projective as an A-module. On the other hand, we have results coming from the study of strongly separable extensions [4, 9], i.e., extensions which are finitely generated and projective as A-modules and separable as A-algebras.

Still a word on method. As we showed in [12], given a finitely generated projective extension B of a Banach algebra A and an element $b \in B$, one can pick out, among all monic polynomials $\alpha(x) \in A[x]$ such that $\alpha(b) = 0$, a canonical one, which enjoys some useful properties (see Lemma 1 below for a precise statement). Then, our method consists in obtaining information about B from information about A (and conversely) by means of these canonical integrity equations.

We fix now some notation. $M_{(\ )}$ and $\partial_{(\ )}$ denote, respectively, the character spectrum and the Shilov boundary operators on Banach algebras; $\hat{f}$ is the Gelfand transform of f. A will denote a fixed uniform algebra on a compact space X, and B a finitely generated projective extension of A. It is known that B can be endowed with a canonical Banach algebra structure [9, Th. 4, p. 138 and 12, § 3].