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Weak-* Maximality of Certain Hardy Algebras $H^\infty(m)$

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The purpose of this paper is to discuss the weak-*maximality of certain Hardy algebras $H^\infty(m)$. Merrill [7] obtained conditions for the maximality of Hardy algebras for logmodular algebras. In this paper we study this problem for hypo-Dirichlet algebras and obtain a similar result as one of Merrill. We also discuss as an application the(uniform) maximality of certain classes of hypo-Dirichlet algebras.

§1. Preliminaries.

Let A be a *uniform algebra* on a compact Hausdorff space X, i.e., let A be a closed subalgebra in $C(X)$ separating points in X and containing constant functions on X, where $C(X)$ denotes the Banach algebra of complex-valued continuous functions on X with the supremum norm. A is called a *hypo-Dirichlet algebra* on X if there exist finite elements $Z_1, Z_2, \cdots, Z_\sigma$ in the family A^{-1} of invertible elements of A such that the real linear space of functions of the form of

$$\mathrm{Re}\,(f)+\sum_{i=1}^{\sigma} c_i \log|Z_i| \quad (f\in A,\ c_i\in \boldsymbol{R})$$

is dense in the space $C_R(X)$ of real continuous functions on X.

Now let A be a hypo-Dirichlet algebra and M_A be the maximal ideal space of A. Then each element ϕ of M_A has a finite dimensional set M_ϕ of representing measures on X for ϕ. And every $\phi\in M_A$ has a unique Arens-Singer measure m on X. A positive measure m on X is called an *Arens-Singer measure* for ϕ if $\log|\phi(f)|=\int \log|f|\,dm$ for all $f\in A^{-1}$ ([1]; [4], p. 116).

The abstract Hardy spaces $H^p(m)$, $1\leqq p\leqq\infty$, associated with A are defined as follows; for $1\leqq p<\infty$, $H^p(m)$ is the $L^p(m)$-closure of A and $H^\infty(m)$ is the weak-*closure of A in $L^\infty(m)$. We see that $H^\infty(m)$ is an

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