Strong and Extremely Strong Ditkin sets for the Banach Algebras $A_p^r(G) = A_p \cap L^r(G)$

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Abstract. Let $A_p(G)$ be the Figa-Talamanca, Herz Banach Algebra on $G$; thus $A_2(G)$ is the Fourier algebra. Strong Ditkin (SD) and Extremely Strong Ditkin (ESD) sets for the Banach algebras $A_p^r(G)$ are investigated for abelian and nonabelian locally compact groups $G$. It is shown that SD and ESD sets for $A_p(G)$ remain SD and ESD sets for $A_p^r(G)$, with strict inclusion for ESD sets. The case for the strict inclusion of SD sets is left open.

A result on the weak sequential completeness of $A_2(F)$ for ESD sets $F$ is proved and used to show that Varopoulos, Helson, and Sidon sets are not ESD sets for $A_2(G)$, yet they are such for $A_2^r(G)$ for discrete groups $G$, for any $1 \leq r \leq 2$.

A result is given on the equivalence of the sequential and the net definitions of SD or ESD sets for $\sigma$-compact groups.

The above results are new even if $G$ is abelian.