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SIDON SETS ASSOCIATED WITH A CLOSED SUBSET OF A COMPACT ABELIAN GROUP

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Déchamps-Gondim in [1] announced that a Sidon set E contained in the dual of a connected compact abelian group G is associated with each compact subset K of G having interior, in the sense that there exists a finite subset F of E and some constant such that this constant times the maximum absolute value of any $E\backslash F$-spectral trignometric polynomial on K majorizes the sum of the absolute values of the Fourier transform. It is readily shown that if G is not connected not all Sidon sets have this property. In [7], Ross described the class of all Sidon sets which are associated with all compact sets K having interior. In this paper, the Sidon sets associated with a particular set K are analysed and characterized.

1. Introduction.

1.1. Throughout this paper, the symbol G is used to denote an arbitrary infinite, compact, abelian group, the symbol X denotes its character group and λ, Haar measure on G. For E a subset of X, we call an integrable function an E-spectral function if its Fourier transform vanishes off E. For any space $F(G)$ of integrable functions, the space of all E-spectral functions belonging to $F(G)$ is denoted by $F_E(G)$. We denote by Trig(G), the space of all complex-valued trignometric polynomials on G and by $A(G)$, the space of all functions with absolutely convergent Fourier series. The usual norm on $A(G)$ is denoted by $\|\ \|_A$. All other notation not explained in this paper appears in López and Ross [6].

DEFINITION 1.2 (see López and Ross [6] p. 109). Let K be a nonvoid compact subset of G and E a subset of X. We say that E and K are *strictly associated* if there exists a constant $\kappa > 0$ such that

$$\|f\|_A \leqq \kappa \|\xi_K f\|_U \quad \text{for all} \quad f \in \mathrm{Trig}_E(G)$$

where ξ_K denotes the characteristic function of K. In particular if E and G are strictly associated, we say that E is a *Sidon set*. We say that E and K are *associated* if $E\backslash F$ and K are strictly associated for some finite subset F of E.