

## Completely Sidon sets in discrete groups

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**Abstract.** A subset of a discrete group  $G$  is called completely Sidon if its span in  $C^*(G)$  is completely isomorphic to the operator space version of the space  $\ell_1$  (i.e.,  $\ell_1$  equipped with its maximal operator space structure). We recently proved a generalization to this context of Drury's classical union theorem for Sidon sets: completely Sidon sets are stable under finite unions. We give a different presentation of the proof emphasizing the "interpolation property" analogous to the one Drury discovered. In addition we prove the analogue of the Fatou-Zygmund property: any bounded Hermitian function on a symmetric completely Sidon set  $\Lambda \subset G \setminus \{1\}$  extends to a positive definite function on  $G$ . In the final section, we give a completely isomorphic characterization of the closed span  $C_\Lambda$  of a completely Sidon set in  $C^*(G)$ : the dual (in the operator space sense) of  $C_\Lambda$  is exact if and only if  $\Lambda$  is completely Sidon. In particular,  $\Lambda$  is completely Sidon as soon as  $C_\Lambda$  is completely isomorphic (by an arbitrary isomorphism) to  $\ell_1(\Lambda)$  equipped with its maximal operator space structure.

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