

# Generating subgroups of the circle using density functions

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This talk is based on the works done along with my students K. Bose, A. Ghosh and D. Dikranjan. In [3] a new version of characterized subgroups of the circle group  $\mathbb{T}$  were introduced called “ $s$ -characterized subgroups” which are essentially different and strictly larger in size than the much investigated class of characterized subgroups, having cardinality  $\mathfrak{c}$  but remaining nontrivial. Recently the notion has further been extended in [2] using the generalized version  $d_g^f$  of the natural density function introduced in [1] where  $g : \mathbb{N} \rightarrow [0, \infty)$  satisfies  $g(n) \rightarrow \infty$  and  $\frac{n}{g(n)} \rightarrow 0$  whereas  $f$  is an unbounded modulus functions. These subgroups have the same feature as the  $s$ -characterized subgroups [3]. But at the same time the utility of this more general approach is justified by constructing new and nontrivial subgroups for suitable choice of  $f$  and  $g$ .

- [1] K. BOSE, P. DAS, AND A. KWELA, *Generating new ideals using weighted density via modulus functions*, Indag. Math., 29 (2018), pp. 1196–1209.
- [2] P. DAS AND A. GHOSH, *Generating subgroups of the circle using a generalized class of density functions*, Indag. Math., 32 (2021), pp. 598–618.
- [3] D. DIKRANJAN, P. DAS, AND K. BOSE, *Statistically characterized subgroups of the circle*, Fund. Math., 249 (2020), pp. 185–209.