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Harmonic Analysis of Operators

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I have chosen to base my talk on the circle group because the main elements needed for research on groups in general are already present therein. Moreover, results in this setting can be as concrete as they are abstract. Thereby making them tractable and, at the same time, instructive. Even then results given here are new except otherwise stated.

Let $\mathbb{Z}$ denote the additive group of integers. Let G denote the circle group which is topologically isomorphic to $\mathbb{R}/2\pi\mathbb{Z}$ or the interval $[0, 2\pi)$. Let $C(G)$ be the circle group algebra of continuous complex functions on the circle group. Let $L_p(G)$, $1 \leq p < \infty$, be the circle group algebra of p^{th}-power absolutely integrable complex functions on G. Let Z be a fixed member of $\{L_p(G) : \infty > p \geq 1\} \cup C(G)$. For each $a \in G$ and $f \in Z$, let $\tau_a f$ be the translate of f by a. A map $A : D_A \subset Z \to Z$ is called a closed densely defined multiplier map (CDDX-map for short) if it is closed densely defined and commutes with translations on D_A.

CDDX-maps were introduced in [1]. We present more results on them here. In particular, we introduce the *Fourier* transform of a CDDX-map, give a concrete identification of the class, $\mathcal{D}(Z)$, of all CDDX-maps on Z, show that $\mathcal{D}(Z)$, set up appropriately, becomes a complete locally multiplicatively convex algebra and extend the study of semigroups of bounded multiplier maps to unbounded ones.

References

[1] Babalola, *Characterization of unbounded multiplier maps,* J. Math. Anal. Appl. 88(1982), 133–142.