RESEARCH ANNOUNCEMENTS

The purpose of this department is to provide early announcement of significant new results, with some indications of proof. Although ordinarily a research announcement should be a brief summary of a paper to be published in full elsewhere, papers giving complete proofs of results of exceptional interest are also solicited. Manuscripts more than eight typewritten double spaced pages long will not be considered as acceptable.

MULTIPLIERS OF p-INTEGRABLE FUNCTIONS[1]

BY ALESSANDRO FIGÀ-TALAMANCA

Communicated by A. E. Taylor, April 9, 1964

1. Introduction. Let G be a locally compact Abelian group. Let $L^p(G)$ $(1 \leqq p < \infty)$ be the space of p-integrable functions (with respect to the Haar measure) with the usual norm. A *multiplier* of $L^p(G)$ is a bounded linear operator T of $L^p(G)$ into $L^p(G)$ which commutes with the translation operators; that is, $\tau_y T = T\tau_y$ for all $y \in G$, where $\tau_y f(x) = f(x+y)$. The space of multipliers will be denoted by $M_p = M_p(G)$. It is known that M_1 is isomorphic and isometric to the space of bounded regular Baire measures on G and that M_2 is isomorphic and isometric to $L^\infty(\Gamma)$, where Γ is the character group of G, and thus M_2 is the conjugate space of the space $A(G)$ of continuous functions on G which are Fourier transforms of elements of $L^1(\Gamma)$. Theorem 1 below asserts that, for $1 < p < \infty$, M_p is also the conjugate space of a space A_p of continuous functions on G. A corollary of this fact is that M_p is the closure in the weak operator topology of the linear span of the translation operators. A theorem due to Hörmander relating tempered distributions on $\mathbf{R}^n$ to $M_p(\mathbf{R}^n)$ [2], is also an easy consequence of Theorem 1. In view of the fact that a multiplier T can be identified with an element $T^\frown \in L^\infty(\Gamma)$ (Γ being the character group of G), another consequence of Theorem 1 is that if $T \in M_p$, $T^\frown * \mu = U^\frown$ with $U \in M_p$, where μ is a bounded regular Baire measure on Γ. If G is a noncommutative unimodular group, a proposition analogous to Theorem 1 holds for operators commuting with right (respec-

[1] This research was supported by the Office of Naval Research, U. S. Navy. Reproduction of this paper in whole or in part is permitted for any purpose of the United States Government.

This note summarizes in part results contained in a dissertation submitted in partial satisfaction of the requirements for the Ph.D. degree at the University of California, Los Angeles, prepared under the direction of Professor Philip C. Curtis, Jr., to whom I am greatly indebted for much valuable advice. Proofs of the results contained in this paper will appear in full elsewhere.