TYPE I ABELIAN GROUPS WITH MULTIPLIERS

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1. INTRODUCTION

Let G be a second countable locally compact group and N a closed normal subgroup of G. The group G then acts naturally by conjugation on N and hence on the dual $\hat{N}$ of N - the unitary equivalence classes of irreducible representations of N with the hull-kernel topology (cf.[3]Ch.3). If N is type I and the action of G on $\hat{N}$ is smooth then it is possible to analyse the irreducible and factor representations of G in terms of those of N and the so-called "little group" H/N (see, for example, [4] Ch.3). Here, for a fixed element π of $\hat{N}$, H is the stabilizer of π under the conjugation action. It turns out, however that one needs to extend the concept of representation of H even to deal with ordinary representations of G. The appropriate concept is that of a multiplier representation. A <u>multiplier</u> on G is a Borel map $\omega:G\times G \to T$ satisfying

(i) $\omega(x,y)\ \omega(xy,z) = \omega(x,yz)\,\omega(y,z) \qquad (x,y,z \in G);$

(ii) $\omega(x,e) = \omega(e,x) = 1 \qquad (x \in G);$

(iii) $\omega(x^{-1},y^{-1}) = \omega(x,y)^{-1} \qquad (x,y \in G),$

and an ω-<u>representation</u> of G is a Borel map π from G into the unitary group $\mathcal{U}(G)$ of a Hilbert space G with the strong operator topology which satisfies

$$\pi(xy) = \omega(x,y)\ \pi(x)\ \pi(y) \qquad (x,y \in G)$$