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FINE STRUCTURE OF THE MACKEY MACHINE FOR ACTIONS OF ABELIAN GROUPS WITH CONSTANT MACKEY OBSTRUCTION

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Let G be a locally compact group, $\omega \in Z^2(G, \mathbb{T})$ a (measurable) multiplier on G, and denote by $C^*(G, \omega)$ the twisted group C^*-algebra of G defined by ω. We are only interested in multipliers up to equivalence, so we always tacitly assume that one is free to vary a multiplier within its cohomology class in $H^2(G, \mathbb{T})$. In this paper we are basically concerned with the following two problems: the first is to determine the structure of $C^*(G, \omega)$, where ω is a type I multiplier on the locally compact abelian group G, and the second is to describe the crossed product $A \rtimes_\alpha G$ of a continuous-trace C^*-algebra A by an action of an abelian group G, such that the corresponding action of G on $\widehat{A}$ has constant stabilizer N, and the Mackey obstruction to extending an irreducible representation ρ of A to a covariant representation (ρ, U) of (A, N, α_N) is equal to a constant multiplier $\omega \in H^2(N, \mathbb{T})$ for all $\rho \in \widehat{A}$. The second of these problems is the obvious starting point for the study of the "fine structure of the Mackey machine", for actions of abelian groups on continuous-trace algebras with "continuously varying" stabilizers and Mackey obstructions.

In case where all Mackey obstructions are trivial, i.e. if α is pointwise unitary on the stabilizer subgroup N, these systems have been investigated extensively in the literature (see for instance [**18**; **22**; **24**; **27**; **28**]), and there are also some results for the case of continuously varying stabilizers [**6**; **26**]. But in recent years there has been almost no progress in the investigation of crossed products with non-trivial Mackey obstructions. However, it turns out that many techniques for the investigation of crossed products by pointwise unitary actions can be used also for the case of non-trivial Mackey obstructions.

Let us explain our results in more detail. In Section 1 we start with investigation of the twisted group algebras $C^*(G, \omega)$ of an abelian group G and a multiplier $\omega \in Z^2(G, \mathbb{T})$. Recall that $C^*(G, \omega)$ can be realized in different ways. It is possible to write $C^*(G, \omega)$ as a completion of $L^1(G, \omega)$, the L^1-algebra of G with convolution and involution twisted by ω, or we can write $C^*(G, \omega)$ as the Green twisted product $\mathbb{C} \rtimes_{\tau_\omega} G(\omega)$, where $G(\omega)$