Lin, Huaxin

Full extensions and approximate unitary equivalence. (English) Zbl 1152.46049


Summary: Let $A$ be a unital separable amenable $C^*$-algebra and let $C$ be a unital $C^*$-algebra with a certain infinite property. We show that two full monomorphisms $h_1, h_2 : A \to C$ are approximately unitarily equivalent if and only if $[h_1] = [h_2]$ in $KL(A, C)$. Let $B$ be a nonunital but $\sigma$-unital $C^*$-algebra for which $M(B)/B$ has a certain infinite property. We prove that two full essential extensions are approximately unitarily equivalent if and only if they induce the same element in $KL(A, M(B)/B)$. The set of approximately unitarily equivalence classes of full essential extensions forms a group. If $A$ satisfies the universal coefficient theorem, the group can be identified with $KL(A, M(B)/B)$.

MSC:

46L05 General theory of $C^*$-algebras
46L35 Classifications of $C^*$-algebras
46L80 $K$-theory and operator algebras (including cyclic theory)

Keywords:

extension of $C^*$-algebras; simple $C^*$-algebras

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