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Zhuang Niu* (zniu@uoregon.edu), Department of Mathematics, University of Oregon, Eugene, OR 97403, and **Huaxin Lin** (hlin@uoregon.edu), Department of Mathematics, University of Oregon, Eugene, OR 97403. *Lifting KK -elements, asymptotical unitary equivalence and classification of simple C^* -algebras.*

Let A and C be two unital simple C^* -algebras with tracial rank zero. Suppose that C is amenable and satisfies the UCT. Denote by $KK_e(C, A)^{++}$ the set of those κ for which $\kappa(K_0(C)_+ \setminus \{0\}) \subset K_0(A)_+ \setminus \{0\}$ and $\kappa([1_C]) = [1_A]$. Suppose that $\kappa \in KK_e(C, A)^{++}$. We show that there is a unital monomorphism $\phi : C \rightarrow A$ such that $[\phi] = \kappa$.

Let $h : C \rightarrow A$ be a unital monomorphism and $\gamma \in \text{Hom}(K_1(C), \text{Aff}(T(A)))$. We show that there exists a unital monomorphism $\phi : C \rightarrow A$ such that $[\phi] = [h]$ in $KK(C, A)$, $\tau \circ \phi = \tau \circ h$ for all tracial states τ and the associated rotation map can be given by γ .

As an application, combining with a result of W. Winter, we show that two unital amenable simple \mathcal{Z} -stable C^* -algebras are isomorphic if they have the same Elliott invariant and the tensor products of these C^* -algebras with any UHF-algebras have tracial rank zero. In particular, if A and B are two unital separable simple \mathcal{Z} -stable C^* -algebras which are inductive limits of C^* -algebras of type I with unique tracial states, then they are isomorphic if and only if they have isomorphic Elliott invariant. (Received March 11, 2008)