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Noncommutative Topological Dynamics and Finiteness in C^ -Crossed Products*

We will discuss group actions on C^* -algebras by interpreting dynamical phenomena K -theoretically, that is, by the induced actions on the K_0 -group and the Cuntz semigroup. K -theoretic characterizations of minimality, topological freeness, and topological transitivity are given and used to generate examples of noncommutative systems with these properties. In the presence of sufficiently many projections we introduce the noncommutative type semigroup which witnesses the finite or rather infinite nature of the underlying action.