

Nuclearity and Exactness for Groupoid Crossed Product C^* -algebras

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Abstract

The focus of this thesis is the study of nuclearity and exactness for groupoid crossed product C^* -algebras. In particular, we present generalizations of two well-known facts from group dynamical systems and crossed products to the groupoid setting. First, we show that if G is an amenable groupoid acting on an upper-semicontinuous C^* -bundle \mathcal{A} with nuclear section algebra A , then the associated groupoid crossed product is a nuclear C^* -algebra. This directly generalizes a classical result of Philip Green. We also extend a similar theorem of Kirchberg regarding exactness—the crossed product of an upper semicontinuous C^* -bundle with exact section algebra by an amenable groupoid is exact. The second result leads us naturally to consider the notion of exactness for locally compact Hausdorff groupoids, which is intimately connected to the reduced groupoid crossed product. The third major result of this thesis falls in this realm: we present a proof that exactness is preserved under equivalence of groupoids. We close with a simple application of this theorem to transitive groupoids.