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SIMPLICITY AND UNIQUENESS OF TRACE OF GROUP C^*-ALGEBRAS

Abstract

A discrete group is C^*-*simple* if the reduced group C^*-algebra $C_r^*(G)$ has no non-trivial proper two-sided closed ideals, and it has the *unique trace property* if the canonical faithful tracial state on $C_r^*(G)$ is the only tracial state. In 1975 Powers published an article proving that the free group on two generators is C^*-simple and has the unique trace property. His result and calculations have been generalized since, and some of these new results will be dealt with in this thesis. In 2014 [**bko**] was released, using theory of boundary actions of discrete groups G on compact Hausdorff spaces to classify when G is C^*-simple, respectively, has the unique trace property, and to show that C^*-simplicity implies the unique trace property. Following up on this an article, due to the late Uffe Haagerup ([**haagerup2015new**]), was released in 2015. This article provided new proofs of precisely when a discrete group G is C^*-simple, respectively, has the unique trace property, using *boundary actions*. We will in this thesis describe C^*-simplicity and the unique trace property in terms of both Dixmier properties and properties of boundary actions of G, found in [**haagerup2015new**].

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