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A GAUGE INVARIANT UNIQUENESS THEOREM FOR CORNERS OF HIGHER RANK GRAPH ALGEBRAS

STEPHEN ALLEN

ABSTRACT. For a finitely aligned k-graph Λ with X a set of vertices in Λ, we define a universal C^*-algebra called $C^*(\Lambda, X)$ generated by partial isometries. We show that $C^*(\Lambda, X)$ is isomorphic to the corner $P_X C^*(\Lambda) P_X$, where P_X is the sum of vertex projections in X. We then prove a version of the Gauge Invariant Uniqueness theorem for $C^*(\Lambda, X)$ and then use the theorem to prove various results involving fullness, simplicity and Morita equivalence as well as results relating to application in symbolic dynamics.

1. Introduction. Much study has been done lately in regards to higher rank graphs (also known as k-graphs) and their associated graph algebras since their first appearance in [**12**]. As k-graphs are a higher-dimensional generalization of directed graphs (which can be regarded as one-dimensional), it is important to be able to adapt the known results for directed graphs to the field of k-graphs. So far this has been done with a reasonable amount of success, for example, see [**1, 13, 19, 23**] to name a few; however, the complex nature of k-graphs often makes the proofs of these adapted results much more complicated than the previous ones.

Corners of graph algebras naturally arise in many places when studying graph algebras, see [**10, 14, 26, 27**] for example, and have been shown to be a necessary tool in the understanding of arbitrary graph algebras. In particular, there is an important link between graph algebras and symbolic dynamics, see [**2, 4, 9**], since directed graphs represent subshifts of finite type, see [**15**]. Transferring results from symbolic dynamics to graph algebras frequently involves using corners.

It is the goal of this paper to provide tools for dealing with corners of k-graph algebras generated by vertex projections. As such, we describe a universal C^*-algebra generated by partial isometries which

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