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The generation conjecture for regular graphs

Unital graph C*-algebras are naturally equipped with extra structure such as a diagonal and a circle action, and it is a pressing problem to find classification results for structure-preserving isomorphisms between two such graph algebras, to supplement the known classification for the C*-algebras by themselves. In ongoing joint work with Ruiz, I have proposed a list of graph moves which we believe generate eight different notions of isomorphism, in the sense that the subcollection of those moves that preserve certain structure also generate the relevant notion of isomorphism as the smallest equivalence relation containing the moves. I will discuss the foundational case of regular graphs with an emphasis on the cases we have not yet been able to resolve, explaining the methods leading to complete results in five cases, and what is holding us back in the remaining three.