

The singular ideal of Katsura Algebras

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We explore the singular ideal associated with Katsura algebras and related algebras. Katsura gave a construction of C^* -algebras from two matrices A and B which could realize all separable, nuclear, purely infinite simple C^* -algebras in the UCT class (Kirchberg Algebras). Exel and Pardo later showed that A and B define a self-similar action which yields an ample groupoid whose reduced C^* -algebra coincides with Katsura's algebra. These groupoids are often non-Hausdorff, and therefore it is desirable to fully characterize simplicity, and more generally, vanishing of the singular ideals of the associated Steinberg Algebra and reduced C^* -algebra. Using inverse semigroups, we attain these characterisations for both Katsura Algebras and algebras built from the faithful quotient of the self-similar action. Additionally, we show that simplicity and vanishing of the singular ideal are algorithmically decidable (even for non-contracting actions). This is joint work with Nóra Szakács.