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The Hao-Ng isomorphism problem

Let (X, C) be a C<sup>\*</sup>-correspondence and  $\alpha$  be a generalized gauge action of a locally compact group G on (X, C), namely  $\alpha$  is a completely isometric module isomorphism. The Hao-Ng isomorphism problem asks if

 $\mathcal{O}_X \rtimes_\alpha G \simeq \mathcal{O}_{X \rtimes_\alpha G}$ 

whether the crossed product of a Cuntz-Pimsner algebra is a Cuntz-Pimsner algebra of a crossed product correspondence. Hao and Ng started this research area by proving that this is true when G is amenable and many people have tried to prove a more general result. Elias Katsoulis and I have rephrased this question as really being a question about non-selfadjoint operator algebras, which is what I will talk about.