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The Bicyclic semigroup algebra

The bicyclic semigroup is generated by two elements, q and p, subject to the relation qp = 1. For a model of this semigroup you may think of the C^* -algebra generated by the right shift and its adjoint on Hilbert space. This C^* -algebra is amenable and so most of its cohomology is trivial. One can also consider the 1-normed algebra generated by this semigroup. The algebra is not amenable, in particular it has (non-inner) derivations into its dual, so is not even weakly amenable. We will see how the semigroup's structure can be used to calculate the cohomology of this algebra.