

EXACTNESS OF UNIVERSAL FREE PRODUCTS OF FINITE DIMENSIONAL C^* -ALGEBRAS WITH AMALGAMATION

BENTON L. DUNCAN

Abstract. We investigate free products of finite dimensional C^* -algebras with amalgamation over diagonal subalgebras. We look to determine under what circumstances such a free product is exact and/or nuclear. We completely characterize exactness of $M_n *_D M_k$ where D is a unital subalgebra of both M_n and M_k . Our characterization depends both on the dimension of D and the embeddings of D into M_j and M_k . We also show that for free products of three finite dimensional algebras exactness fails. Lastly we look at some nonunital embeddings of a diagonal subalgebra into finite dimensional algebras.

Mathematics subject classification (2010): 46L09.

Keywords and phrases: Universal free products, exactness, nuclearity.

REFERENCES

- [1] S. ALBEVERIO, K. JUSHENKO, D. PROSKURIN, AND Y. SAMIOLENKO, **-wildness of some classes of C^* -algebras*, Meth. Funct. Anal. Top., **12** (2006), 315–325.
- [2] S. ARMSTRONG, K. DYKEMA, R. EXEL, AND H. LI, *On embeddings of full amalgamated free product C^* -algebras*, Proc. Amer. Math. Soc., **132** (2004), 2019–2030.
- [3] B. BLACKADAR, *Operator Algebras: Theory of C^* -algebras and von Neumann Algebras*, Springer, New York, 2006.
- [4] L. BROWN, *Ext of certain free product C^* -algebras*, J. Operator Theory, **6** (1981), 135–141.
- [5] J. CUNTZ, *Simple C^* -algebras generated by isometries*, Comm. Math. Phys., **57** (1977), 173–185.
- [6] B. DUNCAN, *Certain free products of graph operator algebras*, J. Math. Anal. Appl., **364** (2010), 534–543.
- [7] K. DYKEMA, *Exactness of reduced amalgamated free product C^* -algebras*, Forum Math., **16** (2004), 161–180.
- [8] E. JUSHENKO AND K. SUKRETNİY, *On *-wildness of a free product of finite-dimensional C^* -algebras*, Meth. Funct. Anal. Top., **12** (2006), 151–156.
- [9] T. LORING, *Lifting Solutions to Perturbing Problems in C^* -algebras*, Amer. Math. Soc., Providence, 1997.
- [10] I. RAEBURN, *Graph Algebras*, Amer. Math. Soc., Providence, 2005.
- [11] S. WASSERMANN, *On tensor products of certain group C^* -algebras*, J. Funct. Anal., **23** (1976), 239–254.