ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

8. Analysis

1991 MS Classification: 18, 46, 47

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Coproducts and projective presentations of operator algebras.

Let B denote the category of unital involutive Banach algebras and their non-expansive homomorphisms and A its full reflective subcategory of C^*-algebras. Coproducts are constructed qua modified tensor products [N] by defining a consistent involution, the tensor greatest cross-norm and further applying, the directed-limit technique. Besides, the unitary group functor $U : A \to Grp$ provides a faithful right adjoint to the group C^*-algebra functor $C^* : Grp \to A$, the function algebra $e(\Gamma, \mathbb{C})$ on the circle group Γ therefore constituting a projective generator. Among various properties every C^*-algebra admits of a projective presentation as a quotient of a suitable copower of $E(\Gamma.\mathbb{C})$, and analogous results for W^*-algebras are obtained, convenient for homological purposes.

Reference: G. F. Nassopoulos, *On the existence of coproducts in the category of noncommutative algebras*, Linear @ Multilinear Algebra **2** (1974), 39 - 54.