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Analytic free semigroup algebras are bi-operator algebras

Let $S = [S_1, \dots, S_n]$ be an analytic row isometry, and \mathfrak{G} the free semigroup algebra generated by S (i.e., \mathfrak{G} is the unital WOT-closed algebra generated by all S_i 's). We prove that \mathfrak{G} is a bi-operator algebra with an integral, and that, in the category of bi-operator algebras, \mathfrak{G} is completely isometrically isomorphic to \mathcal{L}_n , the non-commutative analytic Toeplitz algebra associated to the free semigroup on n generators. Moreover, it is shown that the predual \mathfrak{G}_* of \mathfrak{G} is a completely contractive abelian Banach algebra, and that there is a one-to-one correspondence between the set of all corepresentations of \mathfrak{G} and the set of completely bounded representations of \mathfrak{G}_* .