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A Certain Factorization of Selfdual Cones Associated with Standard Forms of Injective Factors

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Introduction.

In [4] Connes characterized the injective factors on a separable Hilbert space. Applying the reduction theory to the characterization, Choi and Effros proved the equivalence of the injectivity and the semidiscreteness of von Neumann algebras in their papers [1] and [2].

On the other hand, in the category of the ordered Hilbert space many authors gave the answers to the questions how the algebraic structure of a von Neumann algebra determines the structure of the underlying Hilbert space and how the structure of a von Neumann algebra is characterized by the related selfdual cone. Schmitt and Wittstock [11] introduced the notion of the matrix ordered standard form and constructed the von Neumann algebra by using the family of selfdual cones. Furthermore, Schmitt [13] proved the characterization of matrix ordered standard forms of injective von Neumann algebras via several properties in the category of matrix ordered spaces.

Now, Schmitt and Wittstock [12], and Tomiyama and the author [7] investigated the ordered Hilbert spaces induced by the selfdual cones arising in the standard forms of von Neumann algebras introduced by Haagerup [5] and characterized the tensor product of the selfdual cones. In §1 we shall characterize the Hilbert spaces associated with standard forms of injective factors from the point of view of the semidiscreteness and consider the approximation property of n-positive and completely positive maps of a Hilbert-Schmidt class. In §2 we shall investigate a certain factorization of selfdual cones associated with standard forms of injective factors by smooth maximal abelian subalgebras.

We refer mainly [14], [16] and [17] for standard results in the theory of operator algebras.

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