

Connes, A.

Factors of type III_1 , property L'_λ and closure of inner automorphisms. (English)

Zbl 0597.46063

J. Oper. Theory 14, 189-211 (1985).

In [Proc. Symp. Pure Math. Vol. 38, Part 2, 43-109 (1982; Zbl 0503.46043)] A. Connes gave a survey on the classification of W^* -algebra factors. He closed with a remark on the classification of hyperfinite factors of type III_1 . If M is a hyperfinite III_1 -factor which has a trivial bicentralizer then M is isomorphic to the Araki-Woods factor R_∞ . The content of the present paper is the proof of this implication. In the meanwhile this has also been proved by U. Haagerup (forthcoming), who moreover showed that any hyperfinite factor of type III_1 has a trivial bicentralizer, thereby completing the classification of hyperfinite factors what type soever. Whereas Haagerup avoids the automorphism group machinery, Connes' paper supports its use in studying the structure of factors. It also gives a new characterization of the property L'_α (i.e. the existence of an isomorphism of M with $M \otimes R_\lambda$ (R_λ denotes the Araki-Woods factor with $\lambda = (1-\alpha)/\alpha \in]0, 1[$), and of approximately inner automorphisms of type III-factors. Property L'_α and the structure of $\overline{Int}M$ are the two main steps to prove the result, but these two new conditions are too technical to be stated here.

Reviewer: H.Schröder

MSC:

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Keywords:

classification of W^* -algebra factors; hyperfinite factors; trivial bicentralizer; Araki-Woods factor; approximately inner automorphisms