

Uniqueness of almost periodic outer flows on the hyperfinite type II₁ factor

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The classification of flows on the hyperfinite type II₁ factor R , up to cocycle conjugacy, is the one-parameter analogue of Connes' 1975 outer conjugacy classification of automorphisms of R . Since Takesaki raised the problem in the early 1980s, this classification has remained open.

A conjectural picture, recently formulated by Kawahigashi, predicts that every outer flow with full Connes spectrum has the Rokhlin property and is consequently cocycle conjugate to a canonical model flow. In this talk, I will explain a proof of this conjecture for all almost periodic flows, without any assumption on the fixed-point algebra. This class is large and natural; in particular, it includes the flows arising on higher-dimensional simple noncommutative tori.

The main ingredient is a cocycle perturbation theorem which reduces the general case to the prime case, where the fixed-point algebra is a factor. The reduction proceeds through a cohomological argument involving amenable equivalence relations of type III, a somewhat unexpected appearance in the tracial setting of R . This is joint work with Amine Marrakchi.