Power Weakly Mixing Transformations

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Abstract

It follows from Furstenberg’s proof of the multiple recurrence theorem that a weakly mixing, invertible, probability preserving transformation \( T : (X, P) \to (X, P) \) satisfies that for every finite sequence \( n_1, \ldots, n_k \in \mathbb{Z} \setminus \{0\} \),

\[ T^{n_1} \times T^{n_2} \times \cdots \times T^{n_k} \]

is an ergodic measure preserving transformation of \( X^k \). A transformation satisfying the latter property is called “power weakly mixing”. We will survey some history around this property in the non probability preserving case and show constructions of a power weakly mixing, infinite measure preserving markovian \( \mathbb{R} \)-flows and a power weakly mixing non singular Bernoulli shift without an invariant \( P \)-equivalent \( \sigma \)-finite measure.