MIXING TYPE THEOREM FOR POWER BOUNDED MEASURES

H. MUSTAFAYEV[1] and C. TEMEL[2]

[1]*Yuzuncu Yil University, Van TURKEY*
[2]*Yuzuncu Yil University, Van TURKEY*

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Abstract

Let G be a locally compact abelian group with dual group Γ. By $M(G)$ and $L^1(G)$ respectively, we denote the convolution measure algebra and the group algebra of G. For $n \in \mathbb{N}$, by μ^n we denote $n-$times convolution power of $\mu \in M(G)$. A measure $\mu \in M(G)$ which satisfies $\sup_{n\in\mathbb{N}} \|\mu^n\| < \infty$ is called *power bounded*. For a power bounded measure $\mu \in M(G)$, we have $|\widehat{\mu}(\gamma)| \leq 1$ for all $\gamma \in \Gamma$, where $\widehat{\mu}$ is the Fourier-Stieltjes transform of μ. We put

$$\mathcal{E}_\mu := \{\mu \in \Gamma : |\widehat{\mu}(\gamma)| = 1\}.$$

The main result is as follows.

Theorem. *If* $\mu \in M(G)$ *is power bounded, then*

$$\lim_{n\to\infty} \left\|\mu^{n+1} * f - \mu^n * f\right\| = 0, \ \forall f \in L^1(G),$$

if and only if $\widehat{\mu}(\mathcal{E}_\mu) = \{1\}$.

Keywords: group algebra, measure algebra, weak mixing.

References

[1] E. Kaniuth, A. Lau, and A. Ülger, Multipliers of commutative Banach algebras, power boundedness and Fourier-Stieltjes algebras, J. London Math. Soc. 81(2010), 255-275.

[2] Y. Katznelson and L. Tzafriri, On power bounded operators, J. Funct. Anal. 68(1986), 313-328.

[3] R. Larsen, An Introduction to the Theory of Multipliers, Springer-Verlag, New York, 1971.

[4] H. Mustafayev, Mixing type theorems for one-parameter semigroups of operators, Semigroup Forum (in press), 2015, DOI 101007/s00233-015-9707-3.

[1]First Author's e-mail: hsmustafayev@yahoo.com
[2]Second Author's e-mail: cesimtemel@yahoo.com