A GENERALIZATION OF KAWADA AND ITÔ’S THEOREM

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Abstract: For a locally compact group $G$, a continuous automorphism $T$, and a probability measure $\lambda$ on $G$ the sequence given by $\varrho_n := \lambda T(\lambda) \ldots T^{n-1}(\lambda)$ is considered. Under the assumption that the set $\{T^{-n} : n \in \mathbb{N}\}$ is equicontinuous it is shown that $(\varrho_n)_{n \in \mathbb{N}}$ converges, and then necessarily to an idempotent probability measure, if and only if the support of $\lambda$ is not contained in a proper coset $Hx = xT(H) \neq H$ of a compact subgroup $H$ of $G$ and the support of $\lambda$ is contained in a compact $T$-invariant subgroup of $G$.

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