Some Inequalities for the Mean of Almost Periodic Measures

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Abstract: J. Lamadrid and L. Argabright defined the almost periodic measures on a locally compact abelian group G and the mean of theirs. They proved that the measure $f\mu$ which is defined by an almost periodic function f as density and an almost periodic measure μ as base, is also an almost periodic measure.

In our paper we shall explore the following theme: *given an almost periodic function f, an almost periodic measure μ satisfying certain conditions and $c \in \mathbb{R}$, determine when the inequality*

$$f(x) \leq c + M_y[f(xy^{-1})\mu(y)], \quad x \in G,$$

implies the existence of a positive constant k such that

$$M[\frac{1}{f}\mu] \geq k.$$

We denote by $M[\frac{1}{f}\mu]$ the mean of the almost periodic measure defined by $\frac{1}{f}$ as density and by μ as base. For $x \in G$ we denote by $M_y[f(xy^{-1})\mu(y)]$ the mean of the almost periodic measure $g\mu$, where $g(y) = f(xy^{-1}), \forall y \in G$.