

Title: On additive arithmetical functions with values in topological groups III

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We prove that if G is an additively written Abelian topological group with the translation invariant metric ρ and

$$\frac{1}{\log x} \sum_{n \leq x} \frac{\rho(\varphi(n), \varphi(n+1))}{n} \rightarrow 0 \quad (x \rightarrow \infty),$$

where $\varphi : \mathbb{N} \rightarrow G$ is a completely additive function, then the extension $\varphi : \mathbb{R}_x \rightarrow G$ is a continuous homomorphism, where $\mathbb{R}_x$ is the multiplicative group of positive real numbers.

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