Universal series in $\bigcap_{p>1} \ell^p$

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Abstract

Exploiting the recently developed "Abstract Theory of universal series" we give a sufficient condition so that there exists a universal series in $\bigcap_{p>1} \ell^p$. In particular we have approximation by translates of the Riemann zeta function in $\mathbb{C}$ or by translates of a fundamental solution of suitable elliptic operators with constant coefficients in $\mathbb{R}^n$, or by translates of approximate identities in $\mathbb{R}^d$, as for examples, by normal distributions. An application yields universal trigonometric series in $\mathbb{R}^d$ (non-periodic case) with frequencies with finite accumulation points. Improvements of these results are obtained by using universal Dirichlet series in one or several variables, where the only accumulation point of the frequencies is ∞.