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Non-vanishing of special values of L -series attached to Erdős functions

In the spirit of Dirichlet's theorem that $L(1, \chi) \neq 0$ for a non-principal Dirichlet character χ , Sarvadaman Chowla initiated the study of non-vanishing of $L(1, f) = \sum_{n=1}^{\infty} f(n)/n$ for any periodic arithmetical function f whenever the above series converges. This question was extensively studied by S. Chowla, Baker-Birch-Wirsing, T. Okada, R. Tijdeman, M. R. Murty, N. Saradha and many others in different settings. One of the special cases of this study is a conjecture of Erdős. In a written correspondence with A. Livingston, Erdős conjectured that $L(1, f) \neq 0$ provided $f(n) = \pm 1$ when $q \nmid n$ and $f(n) = 0$ when $q \mid n$. This conjecture remains unsolved in the case $q \equiv 1 \pmod{4}$ or alternatively, when $q > 2\phi(q) + 1$. In this talk, we discuss a density theoretic approach towards this conjecture.