

Zeros of partial sums of L -functions

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A general mean-value theorem for multiplicative functions taking values in the unit disc was given by Wirsing (1967) and Halász (1968). We consider a certain class of multiplicative functions $f: \mathbb{N} \rightarrow \mathbb{C}$ and let $F(s) = \sum_{n=1}^{\infty} f(n)n^{-s}$ be the associated Dirichlet series. In this setting, we obtain new Halász-type results for the logarithmic mean value of f . More precisely, we report on estimates for $\sum_{n=1}^x f(n)/n$ in terms of the size of $|F(1 + 1/\log x)|$ and show that these estimates are sharp.

As a consequence, we obtain a non-trivial zero-free region for partial sums of L -functions belonging to our class. We also discuss some results regarding the distribution of zeros of partial sums of the Dedekind zeta function.

This is joint work with Arindam Roy.

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