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3. Number Theory and Arithmetic Algebraic Geometry

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Value-distribution theorems on Lerch zeta-functions

Let $s = \sigma + it$ be a complex variable. The Lerch zeta-function $L(\lambda, \alpha, s)$, for $\sigma > 1$, is defined by

$$L(\lambda, \alpha, s) = \sum_{m=0}^{\infty} \frac{e^{2\pi i \lambda m}}{(m+\alpha)^s}\,.$$

Here α and λ are fixed real parameters, $0 < \alpha \leq 1$. The case $\lambda \notin \mathbf{Z}$ is considered, and then $L(\lambda, \alpha, s)$ is analytically continuable to an entire function. In the report we discuss: a) limit theorems in the sense of the weak convergence of probability neasures for $L(\lambda, \alpha, s)$ on the complex plane and in the space of analytic functions; b) universality property of $L(\lambda, \alpha, s)$; c) functional independence of $L(\lambda, \alpha, s)$; d) zero-distribution of $L(\lambda, \alpha, s)$: zero-free regions, estimates of the number of zeros; e) joint value-distribution theorems for Lerch zeta-functions. Part of these results is joint work with R. Garunkštis and Kohji Matsumoto.