Abstracts of MMA2015, May 26–29, 2015, Sigulda, Latvia


# A DISCRETE LIMIT THEOREM FOR THE PERIODIC HURWITZ ZETA-FUNCTION

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Let $\alpha$, $0 < \alpha \le 1$, be a fixed parameter, $\mathfrak{a} = \{a_m : m \in \mathbb{N}_0 = \mathbb{N} \cup \{0\}\}$ be a periodic sequence of complex numbers. The periodic Hurwitz zeta-function $\zeta(s, \alpha; \mathfrak{a})$, $s = \sigma + it$, is defined, for $\sigma > 1$, by the series

$$\zeta(s, \alpha; \mathfrak{a}) = \sum_{m=0}^{\infty} \frac{a_m}{(m + \alpha)^s},$$

and it is meromorphically continued to the whole complex plane. In [1], we considered the weak convergence for

$$\frac{1}{T}\text{meas}\big\{t \in [0, T] : \zeta(\sigma + it, \alpha; \mathfrak{a}) \in A\big\}, \quad A \in \mathcal{B}(\mathbb{C}),$$

as $T \to \infty$ for various classes of the parameter $\alpha$. In the report, we will discuss a discrete limit theorem for

$$\frac{1}{N+1}\#\big\{0 \le k \le N : \zeta(\sigma + ikh, \alpha; \mathfrak{a}) \in A\big\}, \quad A \in \mathcal{B}(\mathbb{C}),$$

$N \to \infty$. Here $h > 0$ is a fixed number, and $\mathcal{B}(\mathbb{C})$ denotes the Borel $\sigma$-field of the complex plane $\mathbb{C}$. For this, we will use the linear independence over the field of rational numbers for the set

$$\Big\{\big(\log(m + \alpha) : m \in \mathbb{N}_0\big); \frac{\pi}{h}\Big\}.$$

### REFERENCES

[1] A. Rimkevičienė. Limit theorems for the periodic Hurwitz zeta-function. *Šiauliai Math. Semin.*, **5** (13): 55–69, 2010.