

- [14] N. Hindman, D. Strauss, *Algebra in the Stone-Čech compactification*, de Gruyter, Berlin, New York, 1998.

ON SUFFICIENT CONDITIONS FOR A POLYNOMIAL TO BE SIGN-INDEPENDENTLY HYPERBOLIC OR TO HAVE REAL SEPARATED ZEROS

IRYNA KARPENKO

V. N. Karazin Kharkiv National University

XA08942099@student.karazin.ua

The well-known Hutchinson's theorem states that if P be a polynomial with positive coefficients, $P(x) = \sum_{k=0}^n a_k x^k$, and $\frac{a_{k-1}^2}{a_{k-2} a_k} \geq 4$ for $k = 2, 3, \dots, n$, then all the zeros of P are real. We obtain sufficient conditions for a real polynomial to be a sign-independently hyperbolic polynomial or to have real separated roots in the style of Hutchinson's theorem.

Joint work with Anna Vishnyakova.

References

- [1] *J. I. Hutchinson*, On a remarkable class of entire functions, // *Trans. Amer. Math. Soc.* **25** (1923), 325–332.
- [2] *O.M. Katkova, B. Shapiro and A. Vishnyakova*, Multiplier sequences and logarithmic mesh, // *Comptes rendus - Mathematique*, **349** (2011), pp. 35–38, DOI information: 10.1016/j.crma.2010.11.031
- [3] *B. Ja. Levin*, *Distribution of Zeros of Entire Functions* // *Transl. Math. Mono.*, **5**, Amer. Math. Soc., Providence, RI, 1964; revised ed. 1980.

WIMAN'S INEQUALITY FOR ANALYTIC FUNCTIONS IN $\mathbb{D} \times \mathbb{C}$ WITH RAPIDLY OSCILLATING COEFFICIENTS

¹KURYLIAK ANDRIY, ²SKASKIV OLEH, ³TSVIGUN VOLODYMYR

Ivan Franko National University of L'viv, Lviv, Ukraine

¹kurylyak88gmail.com, ²olskaskgmail.com, ³12lvannukr.net

By \mathcal{A}^2 we denote the class of analytic functions $f: \mathbb{D} \times \mathbb{C} \rightarrow \mathbb{C}$, $\mathbb{D} = \{\tau \in \mathbb{C}: |\tau| < 1\}$ of the form $f(z) = f(z_1, z_2) = \sum_{n+m=0}^{+\infty} a_{nm} z_1^n z_2^m$, $z = (z_1, z_2)$. For $r = (r_1, r_2) \in T := [0, 1) \times (0, +\infty)$ and $f \in \mathcal{A}^2$ denote

$$\Delta_r = \{t = (t_1, t_2) \in T: t_1 \geq r_1, t_2 \geq r_2\},$$