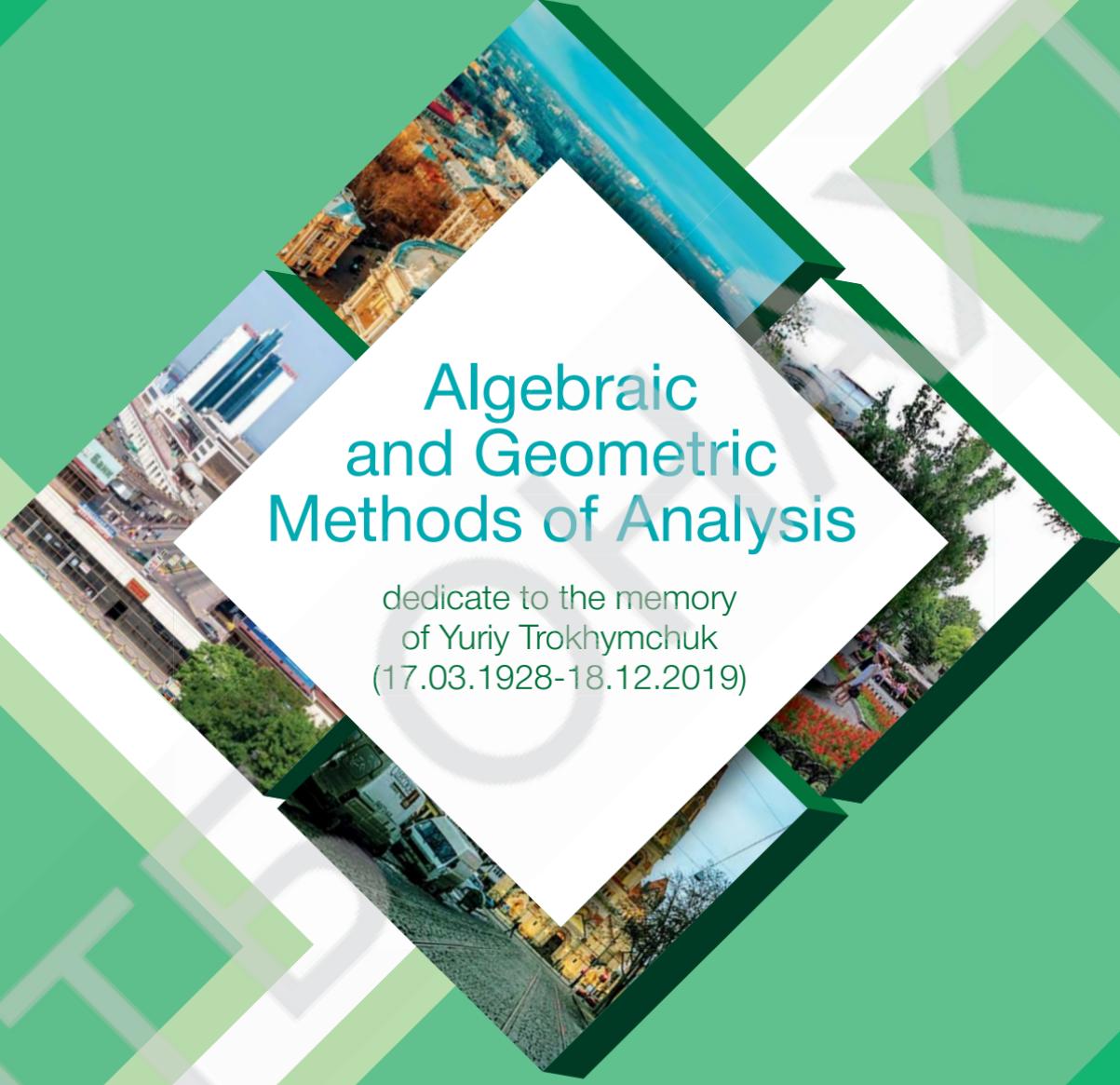


International
Online Conference



Algebraic
and Geometric
Methods of Analysis

dedicate to the memory
of Yuriy Trokhymchuk
(17.03.1928-18.12.2019)

May 25-28, 2021
Odesa, Ukraine

LIST OF TOPICS

- Topological methods in analysis
- Geometric problems of complex and mathematical analysis
- Algebraic methods in geometry
- Differential geometry in the whole
- Geometry and topology of differentiable manifolds
- General and algebraic topology
- Geometric and topological methods in natural sciences

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Conformal mappings in Hardy-type spaces

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Let $H^p(\mathbb{C}_+)$, $1 \leq p < +\infty$, [1] be the Hardy space of analytic in the half-plane $\mathbb{C}_+ = \{z : \Re z > 0\}$ functions, for which

$$\|f\| = \sup_{x>0} \left\{ \int_{-\infty}^{+\infty} |f(x+iy)|^p dy \right\}^{1/p} < +\infty.$$

Let $D_\sigma = \{z : \Re z < 0, |\Im z| < \sigma\}$, $D_\sigma^* = \mathbb{C} \setminus \overline{D}_\sigma$, $\sigma > 0$.

Definition 1. Let $E^p(D_\sigma)$ and $E^p(D_\sigma^*)$, $1 \leq p < +\infty$, $\sigma > 0$, be the spaces of analytic functions in the domains D_σ and D_σ^* respectively, for which

$$\sup \left\{ \int_\gamma |f(z)|^p |dz| \right\}^{1/p} < +\infty,$$

where supremum is taken over all segments γ , that are contained in D_σ and D_σ^* respectively.

We consider the properties of functions in the half-strip D_σ and in the exterior of half-strip D_σ^* . In [2] considered spaces $E^p(D_\sigma)$ and $E^p(D_\sigma^*)$ as spaces of signals. We propose a common point of view on $E^p(D_\sigma)$ and $E^p(D_\sigma^*)$.

Theorem 2. *Function f belongs to $E^2(D_\sigma^*)$ if and only if, when the function*

$$F(w) = f \left(-w + \frac{2\sigma i}{\pi} \cos \frac{w\pi i}{2\sigma} \right) \sqrt{-1 + \sin \frac{w\pi i}{2\sigma}},$$

where $\sqrt{1} = 1$, belongs to $E^2(D_\sigma)$.

The proof of the theorem is based on the following lemma.

Lemma 3. *Function*

$$\tilde{w} = -w + \frac{2\sigma i}{\pi} \cos \frac{w\pi i}{2\sigma}$$

conformally maps D_σ into D_σ^ .*

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