INTERNATIONAL BIWEEKLY ONLINE SEMINAR ON ANALYSIS, DIFFERENTIAL EQUATIONS AND MATHEMATICAL PHYSICS

Coordinators: Prof. Alexey Karapetyants, Prof. Vladislav Kravchenko

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23 February 2023, 6 pm (UTC+3)

Investigation of common properties of Lip and $\mathcal{H}^\infty$ functions (preliminary report)

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This is an expository talk based on two continuing projects with José Bonet, Verónica Dimant, Luis Carlos García Lirola, and Manuel Maestre. Both studies center on spaces of Lipschitz functions and bounded holomorphic functions.

For a metric space (M, d) and a fixed point $x_0 \in M$, let

$$Lip_{x_0}(M) := \{f: M \to \mathbb{K} \mid f(x_0) = 0 \text{ and for some } C \geq 0 \; |f(x) - f(y)| \leq C\, d(x,y), \forall x, y \in M\}.$$

$Lip_{x_0}(M)$ is a Banach space with norm $L(f) := \inf\{C \mid \text{the above inequality holds}\}$.

For a complex Banach space X with open unit ball B_X, let

$$\boldsymbol{\mathcal{H}}^\infty(B_X) := \{f: B_X \to \mathbb{C} \mid f \text{ is holomorphic and bounded}\},$$

which is a Banach space with the sup −norm.

Although these spaces are quite different, they have a number of similarities which we investigate. For one thing, both $Lip_{x_0}(M)$ and $\boldsymbol{\mathcal{H}}^\infty(B_X)$ are dual spaces, and we look at characterizing norm attaining elements of the two spaces. We also describe our study of a "combination"' of these two types of spaces.

*Seminar website: https://msrn.sfedu.ru/sl. The seminar uses Microsoft Teams online platform.
Please send questions to ademp.seminar@gmail.com (Tatiana Andreeva, scientific secretary).

The seminar is organized by the coordinators Alexey Karapetyants and Vladislav Kravchenko within the activities of the Regional Mathematical Center of the Southern Federal University in collaboration with Institute of Mathematics, Mechanics and Computer Sciences of the Southern Federal University and the OTHA research group in Operator Theory and Harmonic Analysis.

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