ЮЖНЫЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ
Региональный математический центр
SOUTHERN FEDERAL UNIVERSITY
Regional Mathematical Center
https://rmc.sfedu.ru/, Rostov-on-Don, Russia

International scientific online seminar on
Analysis, Differential Equations and Mathematical Physics

Coordinators: Prof. Alexey Karapetyants, Prof. Vladislav Kravchenko

4 March 2021, 6 pm (UTC+3)

Grand Lebesgue space for $p=\infty$ and applications or a new life of a 36 years old result of Nikolay Karapetyants and Boris Rubin

Humberto Rafeiro, United Arab Emirates University, UAE, rafeiro@uaeu.ac.ae
Stefan Samko, Algarve University, Portugal, ssamko@ualg.pt

We define the grand Lebesgue space corresponding to the case $p=\infty$ and similar grand spaces for Morrey and Morrey type spaces, also for $p=\infty$, on open sets in $\mathbf{R}^n$. We show that such spaces are useful in the study of mapping properties of the Riesz potential operator in the borderline cases $\alpha p=n$ for Lebesgue spaces and $\alpha p=n-\lambda$ for Morrey and Morrey type spaces, providing the target space "more narrow" than BMO. While for Lebesgue spaces there are known results on the description of the target space in terms better than BMO, the results obtained for Morrey and Morrey type spaces are entirely new. We also show that the obtained results are sharp in a certain sense.

Construction used in the definition of the grand space for $p=\infty$ was used in the one-dimensional case by N. Karapetyants and B. Rubin in 1985 in the study of Riemann-Liouville fractional integrals.

This talk is based on the paper "Grand Lebesgue space for p=∞ and its application to Sobolev-Adams embedding theorems in borderline cases" by H. Rafeiro, S. Samko, and S. Umarkhadzhiev (to appear).

*Seminar website: https://rmc.sfedu.ru/seminar. The seminar uses Microsoft Teams online platform.
To join the seminar, please send a request to pichugina@sfedu.ru (Olga Pichugina, scientific secretary).

The seminar is organized by 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 special Interest ISAAC-OTHA group in Operator Theory and Harmonic Analysis.

Региональный научно-образовательный математический центр
Южный Федеральный Университет
Ростов-на-Дону

Regional Mathematical Center
https://rmc.sfedu.ru/

ИНСТИТУТ МАТЕМАТИКИ МЕХАНИКИ КОМПЬЮТЕРНЫХ НАУК
имени И.И. Воровича

Institute of Mathematics, Mechanics and Computer Sciences
http://www.mmcs.sfedu.ru/

otha
ISAAC

Special Interest ISAAC-OTHA group in Operator Theory and Harmonic Analysis
http://otha.sfedu.ru/isaac/