

1087-46-83

Mikhail I. Ostrovskii* (ostrovsm@stjohns.edu), Department of Mathematics and Computer Sci, 8000 Utopia Parkway, St. John's Univeristy, Jamaica, NY 11439. *On metric characterizations of the Radon-Nikodým property (RNP) of Banach spaces (BS)*. Preliminary report.

In the recent work on metric embeddings a substantial role is played by existence and non-existence of bilipschitz embeddings of metric spaces into BS with RNP (Cheeger, Kleiner, Lee, Naor, 2006–2009). William B. Johnson suggested the problem of metric characterization of RNP (August 2009). This problem can be understood in several different ways, our approach is based on the definition: A metric space X is a *test space* for RNP if the bilipschitz embeddability of X into a BS Y is equivalent to $Y \notin \text{RNP}$. It is an open problem: Does there exist a test space for the RNP? In one of our results we find a class of metric spaces X whose bilipschitz embeddability into Y implies $Y \notin \text{RNP}$, without using Cheeger's (1999) theory of metric differentiation. This class contains the infinite diamond and both Laakso (2000) spaces. We show, however, that none of the spaces X of this class is a test space for RNP: for each such X there exists a BS $Y \notin \text{RNP}$ which does not admit a bilipschitz embedding of X . We also show that a dual BS Y admits a bilipschitz embedding of an infinite diamond if and only if $Y \notin \text{RNP}$. (Received November 28, 2012)