LYAPUNOV THEOREM FOR q-CONCAVE BANACH SPACES

ANNA NOVIKOVA

Let X be a Banach space, (Ω, Σ) be a measure space, where Ω is a set and Σ is a σ-algebra of subsets of Ω. If $m : \Sigma \to X$ is a σ-additive X-valued measure, then the range of m is the set $m(\Sigma) := \{m(A) : \ A \in \Sigma\}$. The measure m is *non-atomic* if for every set $A \in \Sigma$ with $m(A) > 0$, there exist $B \subset A, B \in \Sigma$ such that $m(B) \neq 0$ and $m(A \backslash B) \neq 0$. X-valued measure we will call *Lyapunov measure* if the closure of its range is convex. And Banach space X is *Lyapunov space* if every X-valued non-atomic measure is Lyapunov. The spaces $l_p, \ 1 \leq p < \infty, \ p \neq 2$, and c_0 are Lyapunov spaces [1].

The following result is a generalization of famous Lyapunov theorem for $\mathbb{R}_n$-valued measures [2].

Theorem. Let X be a q-concave, for some $q < \infty$, Banach space with un-conditional basis, and which doesn't contain an isomorphic copy of l_2. Then X is Lyapunov space.

The proof uses some results from [3].

References

[1] V. Kadets and G. Schechtman, The Lyapunov property for ‘p-valued measures, St. Petersburg Math. J. 4(5) (1993), 916-965.

[2] A. Lyapunov, Sur les Fonctions-vecteurs complelement additives, Izv. Akad. Nauk SSSR 4 (1940), 465-478.

[3] V. Mykhaylyuk, M. Popov, B. Randianantoanina, G. Schechtman, Narrow and l_2-strictly singular operators from L_p, (submitted).

Faculty of Mathematics and computer sciences, Weizmann Institute of Sciences, 76100 Rehovot, POB 26, Israel

E-mail address: novikova.anna18@gmail.com