

**Bajdak, G. I.; Braverman, M. Sh.; Petunin, Yu. I.**

**Additivity of the variance is a characteristic property of the Hilbert space  $L_2(\Omega, \mathfrak{A}, \mu)$ .** (English. Russian original) [Zbl 0532.46011](#)

*Funct. Anal. Appl.* 17, 218-220 (1983); translation from *Funkts. Anal. Prilozh.* 17, No. 3, 66-68 (1983).

Let  $(\Omega, \mathfrak{A}, \mu)$  be a measure space with finitely continuous measure  $\mu$ ,  $E$  be a rearrangement-invariant Banach function space on  $\Omega$ . If  $x$  is a random variable and  $m(x) = \int x(\omega) d\mu(\omega)$  its mean value, we define  $\delta(x) = \|x - m(x)\|_E$ . For  $E = L_2(\Omega, \mathfrak{A}, \mu)$  we have  $\delta^2(x) = D(x)$ , where  $D(x)$  is the usual dispersion of  $x$ . In this case  $D(x + y) = D(x) + D(y)$  iff the random variables  $x$  and  $y$  are uncorrelated. The aim of this work is to show, that the validity of equality  $\delta^2(x + y) = \delta^2(x) + \delta^2(y)$  for all independent  $x, y \in E$  is a characteristic property of  $L^2(\Omega, \mathfrak{A}, \mu)$  in some class of rearrangement-invariant spaces  $E$ .

Reviewer: [A.V.Bukhvalov](#)

**MSC:**

**46E30** Spaces of measurable functions ( $L^p$ -spaces, Orlicz spaces, Köthe function spaces, Lorentz spaces, rearrangement invariant spaces, ideal spaces, etc.)

**60A10** Probabilistic measure theory

**Keywords:**

[rearrangement-invariant Banach function space](#); [random variable](#); [dispersion](#)

**Full Text:** [DOI](#)

**References:**

- [1] S. G. Krein, Yu. I. Petunin, and E. M. Semenov, *Interpolation of Linear Operators* [in Russian], Nauka, Moscow (1978).
- [2] A. A. Ershov, *Avtom. Telemekh.*, No. 8, 66-100 (1978).
- [3] E. M. Krasnenker, *Avtom. Telemekh.*, No. 5, 65-88 (1980).
- [4] B. L. Van der Waerden, *Mathematical Statistics* [Russian translation], IL, Moscow (1960). · [Zbl 0184.21701](#)
- [5] J. Neveu, *Mathematical Foundations of Probability Theory* [Russian translation], Mir, Moscow (1969).
- [6] Yu. I. Kuritsyn, Yu. I. Petunin, and E. M. Semenov, *Mat. Zametki*, 10, No. 2, 195-205 (1971).
- [7] S. N. Bernstein, *Collected Works* [in Russian], Vol. 4, Nauka, Moscow (1964).
- [8] Yu. I. Petunin, *Dokl. Akad. Nauk SSSR*, 170, No. 3, 516-519 (1966).

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.