

Mean convergence theorems and weak laws of large numbers for double arrays of random elements in banach spaces

van Dung L., Tien N.D.

Faculty of Mathematics, Danang University of Education, 459 Ton Duc Thang, Danang, Viet Nam; Faculty of Mathematics, National University of Hanoi, 334 Nguyen Trai, Hanoi, Viet Nam

Abstract: For a double array of random elements $\{V_{mn}; m \geq 1, n \geq 1\}$ in a real separable Banach space, some mean convergence theorems and weak laws of large numbers are established. For the mean convergence results, conditions are provided under which The weak law results provide conditions for in probability where $\{T_m; m \geq 1\}$ and $\{T_n; n \geq 1\}$ are sequences of positive integer-valued random variables, $\{k_{mn}; m \geq 1, n \geq 1\}$ is an array of positive integers. The sharpness of the results is illustrated by examples. ?? 2010 The Korean Mathematical Society.

Author Keywords: Double arrays of random elements; Martingale type p Banach spaces; Mean convergence theorem; Weak laws of large numbers; Weighted double sums

Year: 2010

Source title: Bulletin of the Korean Mathematical Society

Volume: 47

Issue: 3

Page : 467-482

Link: Scopus Link

Correspondence Address: van Dung, L.; Faculty of Mathematics, Danang University of Education, 459 Ton Duc Thang, Danang, Viet Nam; email: lvdunght@gmail.com

ISSN: 10158634

DOI: 10.4134/BKMS.2010.47.3.467

Language of Original Document: English

Abbreviated Source Title: Bulletin of the Korean Mathematical Society

Document Type: Article

Source: Scopus

Authors with affiliations:

1. van Dung, L., Faculty of Mathematics, Danang University of Education, 459 Ton Duc Thang, Danang, Viet Nam
2. Tien, N.D., Faculty of Mathematics, National University of Hanoi, 334 Nguyen Trai, Hanoi, Viet Nam

References:

1. Adler, A., Rosalsky, A., Volodin, A.I., A mean convergence theorem and weak law for arrays of random elements in martingale type p Banach spaces (1997) Statist. Probab. Lett., 32 (2), pp. 167-174
2. Chandra, T.K., Uniform integrability in the Cesaro sense and the weak law of large numbers (1989) Sankh??aSer., A51 (3), pp. 309-317
3. Hoffmann-J??rgensen, J., Pisier, G., The law of large numbers and the central limit theorem in Banach spaces (1976) Ann.

Probability, 4 (4), pp. 587-599

4. Landers, D., Rogge, L., Laws of large numbers for pairwise independent uniformly integrable random variables (1987) Math. Nachr., 130, pp. 189-192
5. Ordóñez Cabrera, M., Convergence of weighted sums of random variables and uniform integrability concerning the weights (1994) Collect. Math., 45 (2), pp. 121-132
6. Pisier, G., Martingales with values in uniformly convex spaces (1975) Israel J. Math., 20 (3-4), pp. 326-350
7. Pisier, G., Probabilistic methods in the geometry of Banach spaces (1986) Probability and analysis, 1206, pp. 167-241. , Lecture Notes in Math., Springer, Berlin, (Varenna, 1985)
8. Scalora, F.S., Abstract martingale convergence theorems (1961) Pacific J. Math., 11, pp. 347-374
9. Sung, S.H., Weak law of large numbers for arrays of random variables (1999) Statist. Probab. Lett., 42 (3), pp. 293-298
10. Thanh, L.V., Mean convergence theorems and weak laws of large numbers for double arrays of random variables (2006) J. Appl. Math. Stoch. Anal., 2006, p. 15. , Art. ID 49561