Journal of
Mathematical
Inequalities
Volume 15, Number 1 (2021), 277–291
doi:10.7153/jmi-2021-15-21

ON THE COMPLETE MOMENT CONVERGENCE FOR WEIGHTED SUMS OF WEAKLY DEPENDENT RANDOM VARIABLES

YONGFENG WU* AND YING WANG

Abstract. The authors investigate the complete moment convergence for weighted sums of identically distributed ρ^*-mixing random variables. The obtained results improve the corresponding ones in Li et al. [Li, W., Chen, P. Y., Sung, S. H., 2017. Remark on convergence rate for weighted sums of ρ^*-mixing random variables. Rev. R. Acad. Cienc. Exactas Fs. Nat., Ser. A Mat. (RACSAM), 111: 507–513] and Wu and Peng [Wu, Y. F., Peng, J. Y., 2014. Strong convergence for weighted sums of ρ^*-mixing random variables. Glas. Mat., 49, 221–234]. The authors establish some much stronger conclusions under the same conditions of Li et al. (2017) and Wu and Peng (2014).

Mathematics subject classification (2010): 60F15.
Keywords and phrases: Complete moment convergence, weighted sums, ρ^*-mixing random variable.

REFERENCES

[1] C. C. MOORE, *The degree of randomness in a stationary time series*, Ann. Math. Statist., 34, 1253–258, 1963.
[2] R. C. BRADLEY, *Equivalent mixing conditions for random fields*, Technical Report 336, Center for Stochastic Processes, Dept. Statistics, Univ. North Carolina, Chapel Hill., 1990.
[3] W. BRYC, W. SMOLEŃSKI, *Moment conditions for almost sure convergence of weakly correlated random variables*, Proc. Amer. Math. Soc., 119, 629–635, 1993.
[4] M. PELIGRAD, A. GUT, *Almost-sure results for a class of dependent random variables*, J. Theor. Probab., 12, 87–104, 1999.
[5] S. UTEV, M. PELIGRAD, *Maximal inequalities and an invariance principle for a class of weakly dependent random variables*, J. Theoret. Probab., 16, 101–115, 2003.
[6] G. H. CAI, *Marcinkiewicz strong laws for linear statistics of $\tilde{\rho}$-mixing sequences of random variables*, An. Acad. Bras. Ciênc., 78, 615–621, 2006.
[7] G. H. CAI, *Moment inequality and complete convergence of $\tilde{\rho}$-mixing sequences*, J. Sys. Sci. Math. Scis., 28, 251–256 (in Chinese), 2008.
[8] A. KUCZMASZEWSKA, *On complete convergence for arrays of rowwise dependent random variables*, Statist. Probab. Lett., 77, 1050–1060, 2007.
[9] J. AN, D. M. YUAN, *Complete convergence of weighted sums for $\tilde{\rho}$-mixing sequence of random variables*, Statist. Probab. Lett., 78, 1466–1472, 2008.
[10] Q. Y. WU, Y. Y. JIANG, *Some strong limit theorems for $\tilde{\rho}$-mixing sequences of random variables*, Statist. Probab. Lett., 78, 1017–1023, 2008.
[11] X. C. ZHOU, C. C. TAN, J. G. LIN, *On the strong laws for weighted sums of ρ^*-mixing random variables*, J. Inequal. Appl., doi:10.1155/2011/157816, 2011.
[12] S. H. SUNG, *On the strong convergence for weighted sums of ρ^*-mixing random variables*, Stat. Papers, 54, 773–781, 2013.
[13] Y. F. WU, C. H. WANG, A. VOLODIN, *Limiting behavior for arrays of rowwise ρ^*-mixing random variables*, Lith. Math. J., 52, 214–221, 2012.
[14] J. X. WANG, X. Q. LI, W. Z. YANG,, S. H. HU, *On complete convergence for arrays of rowwise weakly dependent random variables*, Appl. Math. Lett., 25, 1916–1920, 2012.

Paper JMI-15-21

[15] M. L. GUO, D. J. ZHU, *Equivalent conditions of complete moment convergence of weighted sums for ρ^*-mixing sequence of random variables*, Statist. Probab. Lett., 83, 13–20, 2013.
[16] Y. F. WU, S. H. SUNG, A. VOLODIN, *A note on the rates of convergence for weighted sums of ρ^*-mixing random variables*, Lith. Math. J. 54, 220–228, 2014.
[17] Y. F. WU, J. Y. PENG, *Strong convergence for weighted sums of ρ^*-mixing random variables*, Glas. Mat., 49, 221–234, 2014.
[18] W. LI, P. Y. CHEN, S. H. SUNG, *Remark on convergence rate for weighted sums of ρ^*-mixing random variables*, Rev. R. Acad. Cienc. Exactas Fs. Nat., Ser. A Mat. (RACSAM), 111: 507–513, 2017.
[19] P. L. HSU, H. ROBBINS, *Complete convergence and the law of large numbers*, Proc. Nat. Acad. Sciences., 33, 25–31, 1947.
[20] Y. S. CHOW, *On the rate of moment complete convergence of sample sums and extremes*, Bull. Inst. Math., Acad. Sin., 16, 177–201, 1988.
[21] P. Y. CHEN, S. H. SUNG, *On the strong convergence for weighted sums of negatively associated random variables*, Statist. Probab. Lett., 92, 45–52, 2014.
[22] Z. D. BAI, P. E. CHENG, *Marcinkiewicz strong laws for linear statistics*, Statist. Probab. Lett., 46, 105–112, 2000.
[23] P. Y. CHEN, S. H. SUNG, *Generalized Marcinkiewicz-Zygmund type inequalities for random variables and applications*, J Math. Inequal., 10, 837–848, 2016.