Strong Approximation for Mixing Sequences with Infinite Variance

Raluca Balan, *University of Ottawa, Canada*
Ingrid-Mona Zamfirescu, *City University of New York, USA*

Abstract

In this paper we prove a strong approximation result for a mixing sequence with infinite variance and logarithmic decay rate of the mixing coefficient. The result is proved under the assumption that the distribution is symmetric and lies in the domain of attraction of the normal law. Moreover the truncated variance function is supposed to be slowly varying with log-log type remainder.

Full text: PDF | PostScript

Pages: 11-23

Published on: January 24, 2006

Bibliography

1. R.M. Balan and R. Kulik. Self-normalized weak invariance principle for mixing sequences. *Tech. Rep. Series, Lab. Research Stat. Probab., Carleton University-University of Ottawa* 417 (2005). Math. Review number not available.
2. N.H. Bingham, C.M. Goldie and J.L. Teugels. *Regular Variation.* (1987) Cambridge University Press, Cambridge. Math. Review 91a:26003
3. R.C. Bradley. Basic properties of strong mixing conditions. A survey and some open questions. *Probability Surveys* 2 (2005), 107-144. Math. Review MR2178042
4. M. Csörgö, B. Szyszkowicz and Q. Wang. Donsker's theorem for self-normalized partial sum processes. *Ann. Probab.* 31 (2003), 1228-1240. Math. Review 2004h:60031
5. W. Feller. An extension of the law of the iterated logarithm to variables without variance. *J. Math. Mech.* 18 1968, 343-355. Math. Review 0233399
6. W. Feller. *An introduction to probability theory and its applications. Vol. II. Second Edition.* (1971), John Wiley, New York. Math. Review 0270403
7. P. Hall and C.C.Heyde. *Martingale limit theory and its applications.* (1980) Academic Press, New York. Math. Review 83a:60001
8. H. Kesten. Sums of independent random variables - without moment conditions. *Ann. Math. Stat.* 43 (1972), 701-732. Math. Review MR0301786
9. H. Kesten and R.A. Maller. Some effects of trimming on the law of the iterated logarithm. *J. Appl. Probab.* 41A (2004), 253-271. Math. Review 2005a:60038
10. M. Loève. *Probability theory. Vol. II. Fourth Edition.* (1978) Springer, New York. Math. Review MR0651018
11. J. Mijnheer. A strong approximation of partial sums of i.i.d. random variables with infinite variance. *Z. Wahrsch. verw. Gebiete* 52 (1980), 1-7. Math. Review 81e:60032
12. S. Y. Novak. On self-normalized sums and Student's statistic. *Theory Probab. Appl.* 49 (2005), 336-344. Math. Review 2005m:60038
13. W. Philipp and W.F. Stout. Almost sure invariance principles for partial sums of weakly dependent random variables. *Mem. AMS. Vol. 2* 161 (1975). Math. Review MR0433597
14. Q.-M. Shao. Almost sure invariance principles for mixing sequences of random variables. *Stoch. Proc. Appl.* 48 (1993), 319-334. Math. Review 95c:60030
15. Q.-M. Shao. An invariance principle for stationary rho-mixing sequences with infinite variance. *Chin. Ann. Math. Ser. B.* 14 (1993), 27-42. Math. Review 94f:60051

Electronic Communications in Probability. ISSN: 1083-589X