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ON THE UNIVERSAL CONSTANT IN THE KATZ-PETROV AND OSIPOV INEQUALITIES *

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Abstract

Upper estimates are presented for the universal constant in the Katz-Petrov and Osipov inequalities which do not exceed 3.1905.

Keywords and phrases: central limit theorem, convergence rate estimate, absolute constant, Katz-Petrov inequality, Osipov inequality.

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REFERENCES

- [1] R.N. Bhattacharya and R. Ranga Rao, *Normal Approximation and Asymptotic Expansions* (New York, Wiley, 1976).
- [2] L.H.Y. Chen and Q.M. Shao, *A non-uniform Berry-Esseen bound via Stein's method*, *Probability Theory and Related Fields* **120** (2001) 236–254.
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- [3] W. Hoeffding, *The extrema of the expected value of a function of independent random variables*, Ann. Math. Statist. **19** (1948) 239–325.
- [4] M. Katz, *Note on the Berry-Esseen theorem*, Annals of Math. Statist. **39** (4) (1963) 1348–1349. doi:10.1214/aoms/1177698261
- [5] V.Yu. Korolev and I.G. Shevtsova, *An improvement of the Berry-Esseen inequality with applications to Poisson and mixed Poisson random sums*, Scandinavian Actuarial Journal, 2010. Online first: <http://www.informaworld.com/10.1080/03461238.2010.485370>, 04 June 2010.
- [6] J.S. Nefedova and I.G. Shevtsova, *On non-uniform estimates of convergence rate in the central limit theorem*, Theory Probab. Appl. **56** (2011), to appear.
- [7] L.V. Osipov, *A refinement of the Lindeberg theorem*, Theory Probab. Appl. **11** (2) (1966) 339–342. doi:10.1137/1111026
- [8] L. Paditz, *Bemerkungen zu einer Fehlerabschätzung im zentralen Grenzwertsatz*, Wiss. Z. Hochschule für Verkehrswesen Friedrich List **27** (4) (1980) 829–837.
- [9] L. Paditz, *On error-estimates in the central limit theorem for generalized linear discounting*, Math. Operationsforsch. u. Statist., Ser. Statistics **15** (4) (1984) 601–610. doi:10.1080/02331888408801816
- [10] L. Paditz, *Über eine Fehlerabschätzung im zentralen Grenzwertsatz*, Wiss. Z. Hochschule für Verkehrswesen Friedrich List Dresden **33** (2) (1986) 399–404.
- [11] V.V. Petrov, *An estimate of the deviation of the distribution of a sum of independent random variables from the normal law*, Soviet Math. Dokl. **160** (5) (1965) 1013–1015.
- [12] V.V. Petrov, Sums of Independent Random Variables (New York, Springer, 1975). doi:10.1007/978-3-642-65809-9
- [13] I.G. Shevtsova, *A refinement of the estimates of the rate of convergence in the Lyapunov theorem*, Doklady Mathematics **435** (1) (2010) 26–28.

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