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5. A sekce:

Počet pravděpodobnosti a aplikovaná matematika.

THE APPROXIMATION OF THE LIMIT PROBABILITY LAW.

HALINA MILICER-GRUŻEWSKA, Warszawa.

The conditions under which the assymptotic expansion theorem is fulfilled,[1]) if the random variables are equivalent,[2]) are examined.

We prove that the central limit theorem is false, if the equivalent variables are strongly correlated and uniformly bounded, although, it is known[3]) that this theorem is true if the moments of these variables fulfil some special conditions (1).

Even if we suppose that the conditions (1) are satisfied, the assymptotic expansion theorem may be false, if some further moments of the same variables do not fulfil additional conditions (2). However, if we suppose that the conditions (1) and (2) are satisfied, we obtain the following approximation for the distribution function $F_n(x)$ of the standardized sum of n equivalent variables:

$$F_n(x) = \Phi(x) + o(n^{-\alpha} \log^{-1} n), \quad 0 < \alpha < 1,$$

where $\Phi(x)$ is the Gauss-Laplace integral. The properties of the distribution function $F_n(x)$ and of the corresponding characteristic function $\varphi_n(t)$ depend on the properties of the joined distribution $F_n(x_1, \ldots, x_n)$ of the equivalent variables $X_1, X_2, \ldots, X_n$ we describe.

Conditions (1) and (2) essentially differ from the analogous conditions for the case of independent random variables. They consist not only

[1]) H. CRAMER: *Random Variables and Probability Distributions*, Cambridge, ch. VII, Th. **25** (1937), 81—83.

[2]) B. de FINETTI: *Classi di numeri aleatori equivalenti*, Rendiconti della Reale Accademia Nazionale dei Lincei, 6a vol. XVIII (1933), 203—207.

[3]) H. MILICER-GRUŻEWSKA: *Sulla legge limite delle variabli casuali equivalenti*, Atti d. Acc. Naz. d. Lincei, S. VIII-v. II, ser. Ia, **2** (1948), Theorema 1, pp. 28—29.