3,1481⟩. Этот результат является небольшим улучшением результата, приведенного в работе Мантела [6]. Выводы §§ 2-ого и 4-ого иллюстрированы двумя численными примерами.

Summary

STOCHASTIC NUMERICAL METHODS

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The paper reports about the application of the so-called Monte Carlo methods in numerical calculation. The nature of this application is enlightened in § 1 by the example of the empirical determination of π. In § 2 the statistic $I = (b - a)\, n^{-1} \sum_{k=1}^{n} f(x_k)$ — where x_k are independent, uniformly distributed in $\langle a, b \rangle$ — is studied, as an estimator of the integral $\int_a^b f(x)\,\mathrm{d}x$. (Cf. KITAGAWA [2].) A numerical example is given. In § 3 an idea due to TOCHER [3] is developed concerning the Monte Carlo evaluation of volumes of multidimensional bodies which are defined by complicated implicit relations between coordinates. A method is deduced which is a combination of the mathematical method and the Monte Carlo one, and which gives (in certain sense) the best accuracy. A result is given which can be called the stochastic modification of the lattice points problem. In § 4, matrix inversion by a Monte Carlo method is described, according to FORSYTHE-LEIBLER [5]. New are the formulae (3)—(6), i. e. the upper estimates of σ^2 and $E(\tau)$ in which the elements of the unknown inverse matrix do not occur. In § 5, the assertion $\pi \in (3{,}1380;\ 3{,}1481)$ is proved in a purely probabilistic way. This result is a slight improvement of an analogous result contained in a paper of MANTEL [6].