## by JEAN-FRANÇOIS MERTENS and SHMUEL ZAMIR

## Abstract

We consider a repeated two - person zero - sum game in which the payoffs in the stage game are given by a 2×2 matrix. This is chosen (once) by chance, at the beginning of the game, to be either  $G^1$  or  $G^2$ , with probabilities p and 1-p respectively. The maximizer is informed of the actual payoff matrix chosen but the minimizer is not. Denote by  $v_n(p)$ the value of the n - times repeated game (with the payoff function defined as the average payoff per stage), and by  $v_{\infty}(p)$  the value of the infinitely repeated game. It is proved that

$$v_n(p) = v_{\infty}(p) + K(p)\frac{f(p)}{\sqrt{n}} + o\left(\frac{1}{\sqrt{n}}\right)$$

where f(p) is an appropriately scaled normal distribution density function evaluated at its p-quantile, and the coefficient K(p) is either 0 or the absolute value of a linear function in p.