ON THE EXISTENCE OF A PERIODIC SOLUTION FOR A STOCHASTIQUE EQUATION WITH INTERRUMTION INTERVALS

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we consider a class of stochastic equations with coefficients defined on a union of closed time intervals; during the break between two closed intervals the process has to evolve passively with the coefficients determined at the last moment of the previous closed interval. Under the assumption of the periodicity of the union of closed intervals and of the coefficients, we prove the existence of a periodic solution. The proof is based on the techniques developed by Khas'minskii for the analogous problem in case of usual stochastic equations. We present also some remarks about the possibility of application to the stochastic modeling of the hibernation, we are interested by giving some numerical results for one kind of stochastic prey-predator model. [1, 3]

References

[1] HAS'MINSKII, R. Z. (1980): *Stochastic stability of differential equations* (translated from Russian). Sijthoff & Noordhoff.

[2] Korichi,F. (2015). *Existence et unicité de la solution pour une classe d'équations stochastiques à coefficients définis par rapport à un ensemble fermé de temps.*, Rendiconti Del Seminario Matematico Universit e Politecnico di Torino, Volume 73/2 (2015), 227–243.

[3] Korichi,F. and Hisao Fujita, Y. . (2017). *Solucion periodica de las ecuaciones estocasticas con coeficientes definidos en una union de intervalos cerrados*, Investigacion Operacional, Volume 38 (2017), No.4, 320–330.