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Existence of almost periodic solutions of stochastic differential equations with periodic coefficients. (English) [Zbl 1359.60071](#)

Random Oper. Stoch. Equ. 25, No. 1, 57-70 (2017).

Summary: In this work, under some conditions, we will prove that a scalar stochastic differential equation with periodic coefficients admits almost periodic solutions.

MSC:

- 60H10 Stochastic ordinary differential equations (aspects of stochastic analysis)
- 34F05 Ordinary differential equations and systems with randomness
- 34C27 Almost and pseudo-almost periodic solutions to ordinary differential equations
- 34G10 Linear differential equations in abstract spaces

Keywords:

stochastic differential equations; L_2 -bounded solutions; L_2 -almost periodic solutions

Full Text: [DOI](#)

References:

- [1] Amério L. and Prouse G., Almost Periodic Functions and Functional Equations, Van Nostrand, New York, 1971.
- [2] Arnold L. and Tudor C., Stationary and almost periodic solutions of almost periodic affine stochastic differential equations, Stochastics Stochastics Rep. 64 (1998), no. 3-4, 177-193. · [Zbl 1043.60513](#)
- [3] Bezandry P. H. and Diagana T., Existence of almost periodic solutions to some stochastic differential equations, Appl. Anal. 86 (2007), no. 7, 819-827. · [Zbl 1130.34033](#)
- [4] Bezandry P. H. and Diagana T., Existence of quadratic-mean almost periodic solutions to some stochastic hyperbolic differential equations, Electron. J. Differential Equations 2009 (2009), no. 111, 1-14. · [Zbl 1185.35345](#)
- [5] Blot J., Une approche variationnelle des orbites quasi-périodiques des systèmes Hamiltoniens, Ann. Sci. Math. Qué. 13 (1989), no. 2, 7-32. · [Zbl 0698.70015](#)
- [6] Da Prato G., Periodic and almost periodic solutions for semilinear stochastic equations, Stoch. Anal. Appl. 13 (1995), no. 1, 13-33. · [Zbl 0816.60062](#)
- [7] Dorogovtsev A. Y., The existence of periodic solutions of an abstract stochastic equation. Asymptotic periodicity of solutions of the Cauchy problem (in Russian), Teor. Veroyatn. Mat. Stat. Kiev 39 (1988), 47-52; translation in Theory Probab. Math. Statist. 39 (1989), 55-60. · [Zbl 0669.60056](#)
- [8] Doss H., Liens entre équations différentielles stochastiques et ordinaires, C. R. Acad. Sci. Paris Ser. A 283 (1976), 939-942. · [Zbl 0352.60044](#)
- [9] Doss H., Sur l'existence, l'unicité et le comportement asymptotique des solutions d'équations différentielles stochastiques, Ann. Inst. Henri Poincaré, Nouv. Sér. Sect. B 14 (1978), no. 2, 198-214. · [Zbl 0392.60046](#)
- [10] Doss H. and Postelnicu G., Sur une approche probabiliste d'un problème d'analyse semi-classique, J. Funct. Anal. 224 (2005), 352-370. · [Zbl 1076.35019](#)
- [11] Guikhman I. and Skorokhod A., Introduction à la théorie des processus aléatoires, Mir, Moscow, 1980.
- [12] Guillin-Plantard N., Introduction au calcul stochastique, Technical Report, Polycopié Université de Lyon 1, France, 2009.
- [13] Has'minskii R. Z., Stochastic Stability of Differential Equations, Sijthoff and Noordhoff, USA, 1980.
- [14] Karatzas I. and Shreve S., Brownian Motion and Stochastic Calculus, Springer, New York, 1988. · [Zbl 0638.60065](#)
- [15] Massera J. L., The existence of periodic solutions of systems of differential equations, Duke Math. J. 17 (1950), 457-475. · [Zbl 0038.25002](#)
- [16] Mellah O. and De Fitte P. R., Countre examples to mean square almost periodicity of the solutions of some SDES with almost periodic coefficients, preprint 2012, . · [Zbl 1288.60073](#)
- [17] Morozan T., Periodic solutions of stochastic discrete-time systems, Roumaine Math. Appl. 32 (1987), 351-363. · [Zbl 0644.93056](#)
- [18] Morozan T. and Tudor C., Almost periodic solutions of affine Itô equations, Stoch. Anal. Appl. 7 (1989), no. 4, 451-474. · [Zbl 0692.60045](#)
- [19] Tudor C., Almost periodic solutions of affine stochastic evolution equations, Stochastics Stochastics Rep. 38 (1992), no. 4,

251-266. · Zbl 0752.60049

- [20] Vârsan C., Asymptotic almost periodic solutions for stochastic differential equations, *Tohoku Math. J. (2)* 41 (1986), 609-618.
· Zbl 0689.60060
- [21] Yoshizawa T., *Stability Theory by Ljapunov's Second Method*, Publ. Math. Soc. Japan. 9, Mathematical Society of Japan, Tokyo, 1966.

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