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Global attracting sets and stability of neutral stochastic functional differential equations driven by Rosenblatt process. (English) Zbl 1390.60241

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Summary: We are concerned with a class of neutral stochastic partial differential equations driven by Rosenblatt process in a Hilbert space. By combining some stochastic analysis techniques, tools from semigroup theory, and stochastic integral inequalities, we identify the global attracting sets of this kind of equations. Especially, some sufficient conditions ensuring the exponent p-stability of mild solutions to the stochastic systems under investigation are obtained. Last, an example is given to illustrate the theory in the work.

MSC:

60H15 Stochastic partial differential equations (aspects of stochastic analysis)

Keywords:

global attracting sets; exponential p-th moment stability; Rosenblatt process

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References:

[1] Albin, J M P, A note on Rosenblatt distributions, Statist. Probab. Lett, 40, 83-91, (1998) · Zbl 0951.60019

[2] Bardet, J M; Tudor, C A, A wavelet analysis of the Rosenblatt process: chaos expansion and estimation of the self-similarity parameter, Stochastic Process Appl, 120, 2331-2362, (2010) · Zbl 1203.60043

[3] Boudrahem, S; Rougier, P R, Relation between postural control assessment with eyes open and centre of pressure visual feed back effects in healthy individuals, Exp Brain Res, 195, 145-152, (2009)

[4] Comte, F; Renault, E, Long memory continuous time models, J Econometrics, 73, 101-149, (1996) · Zbl 0856.62104

[5] Fuente, I M; Perez-Samartin, A L; Matnez, L; Garcia, M A; Vera-Lopez, A, Long-range correlations in rabbit brain neural activity, Ann Biomed Eng, 34, 295-299, (2006)

[6] Li, D S; Xu, D Y, Attracting and quasi-invariant sets of stochastic neutral partial functional differential equations, Acta Math Sci Ser B Engl Ed, 33, 578-588, (2013) · Zbl 1289.35341

[7] Long, S; Teng, L; Xu, D Y, Global attracting set and stability of stochastic neutral partial functional differential equations with impulses, Statist Probab Lett, 82, 1699-1709, (2012) · Zbl 1250.93124

[8] Maejima, M; Tudor, C A, Wiener integrals with respect to the Hermite process and a non central limit theorem, Stochastic Anal Appl, 25, 1043-1056, (2007) · Zbl 1130.60061

[9] Maejima, M; Tudor, C A, On the distribution of the Rosenblatt process, Statist Probab Lett, 83, 1490-1495, (2013) · Zbl 1287.60024

[10] Pazy A. Semigroup of Linear Operators and Applications to Partial Differential Equations. New York: Spring-Verlag, 1992 · Zbl 0516.47023

[11] Rypdal, M; Rypdal, K, Testing hypotheses about Sun-climate complexity linking, Phys Rev Lett, 104, 128-151, (2010)

[12] Shen, G J; Ren, Y, Neutral stochastic partial differential equations with delay driven by Rosenblatt process in a Hilbert space, J Korean Statist Soc, 44, 123-133, (2015) · Zbl 1311.60073

[13] Shen, G J; Yin, X; Yan, L T, Approximation of the Rosenblatt sheet, Mediterr J Math, 13, 2215-2227, (2016) · Zbl 1346.60022

[14] Shen, G J; Yin, X; Zhu, D J, Weak convergence to Rosenblatt sheet, Front Math China, 10, 985-1004, (2015) · Zbl 1321.60042

[15] Shieh, N R; Xiao, Y M, Hausdorff and packing dimensions of the images of random fields, Bernoulli, 16, 926-952, (2010) · Zbl 1227.60049

[16] Simonsen, I, Measuring anti-correlations in the nordic electricity spot market by wavelets, Phys A, 322, 597-606, (2003) · Zbl 1017.91026

[17] Taqqu, M S, Weak convergence to fractional Brownian motion and to the Rosenblatt process, Probab Theory Related Fields, 31, 287-302, (1975) · Zbl 0303.60033

[18] Tudor, C A, Analysis of the Rosenblatt process, ESAIM Probab Stat, 12, 230-257, (2008) · Zbl 1187.60028

[19] Tudor, C A; Viens, F G, Variations and estimators for self-similarity parameters via Malliavin calculus, Ann Probab, 37,

2093-2134, (2009) · Zbl 1196.60036

[20] Veillette, M; Taqqu, M S, Properties and numerical evaluation of the Rosenblatt distribution, Bernoulli, 19, 982-1005, (2013) · Zbl 1273.60020

[21] Willinger, W; Leland, W; Taqqu, M; Wilson, D, On self-similar nature of Ethernet traffic, IEEE/ACM Trans Networking, 2, 1-15, (1994)

[22] Xu, D Y; Long, S J, Attracting and quasi-invariant sets of no-autonomous neutral networks with delays, Neurocomputing, 77, 222-228, (2012)

[23] Zhao, Z H; Jian, J G, Attracting and quasi-invariant sets for BAM neural networks of neutral-type with time-varying and infinite distributed delays, Neurocomputing, 140, 265-272, (2014)