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Asymptotic periodicity of the Volterra equation with infinite delay. (English) Zbl 1133.35004
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Asymptotic periodic properties are obtained for special Volterra delay differential equations. As an example the following equation is considered

$$\begin{aligned} \frac{\partial u}{\partial t} - \frac{\partial^2 u}{\partial x^2} &= u \left[a - bu - c \int_0^\infty u(t - \tau, x) d\mu(\tau) \right], & (t, x) &\in (0, \infty) \times (0, 1), \\ u(t, 0) &= u(t, 1) = 0, & t &\in (0, \infty), \\ u(t, x) &= \varphi(t, x), & (t, x) &\in (-\infty, 0] \times [0, 1]. \end{aligned}$$

Reviewer: Leonid Berezhanski (Beer-Sheva)

MSC:

[35B10](#) Periodic solutions to PDEs
[35B40](#) Asymptotic behavior of solutions to PDEs
[35R10](#) Partial functional-differential equations
[45K05](#) Integro-partial differential equations

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Keywords:

Volterra equation; asymptotic periodicity, delay

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References:

- [1] Gopalsamy, K.; He, X.Z., Dynamics of an almost periodic logistic integro-differential equation, Bulletin of the institute of mathematics. academia sinica, 20, 3, 267-284, (1992)
- [2] Henriquez, H.R., Regularity of solutions of abstract retarded functional differential equations with unbounded delay, Nonlinear analysis, 28, 513-531, (1997) · [Zbl 0864.35112](#)
- [3] Hess, P., ()
- [4] Lu, X., Periodic solution and oscillation in a competition model with diffusion and distributed delay effects, Nonlinear analysis, 27, 6, 699-709, (1996) · [Zbl 0862.35134](#)
- [5] Pao, C.V., Coupled nonlinear parabolic systems with time delays, Journal of mathematical analysis and applications, 196, 237-265, (1995) · [Zbl 0854.35122](#)
- [6] Pao, C.V., Nonlinear parabolic and elliptic equations, (1992), Plenum Press New York · [Zbl 0780.35044](#)
- [7] Ruan, S.G.; Wu, J.H., Reaction – diffusion equations with infinite delay, The Canadian applied mathematics quarterly, 2, 485-550, (1994) · [Zbl 0836.35158](#)
- [8] Redlinger, R., Existence theorems for semi-linear parabolic systems with functionals, Nonlinear analysis, 8, 6, 667-682, (1984) · [Zbl 0543.35052](#)
- [9] Shi, B.; Chen, Y., A priori bounds and stability of solutions for a Volterra reaction – diffusion equation with infinite delay, Nonlinear analysis, 44, 97-121, (2001) · [Zbl 0981.35095](#)
- [10] Smoller, J., Shock waves and reaction – diffusion equations, (1983), Springer · [Zbl 0508.35002](#)
- [11] Volterra, V., Lecons sur la theorie mathematique de la lutte pour la vie, (1931), Gauthier-Villars Paris · [Zbl 57.0466.02](#)
- [12] Wu, J.H., Theory and applications of partial functional differential equations, (1996), Springer New York
- [13] Wang, J.L.; Zhou, L., Existence and uniqueness of periodic solution of delayed logistic equation and its asymptotic behavior, Journal of partial differential equations, 16, 4, 1-13, (2003)
- [14] Wang, J.L.; Zhou, L.; Tang, Y.B., Asymptotic periodicity of a food-limited diffusive population model with time-delay, Journal of mathematical analysis and applications, 313, 2, 381-399, (2006) · [Zbl 1096.35123](#)
- [15] Zhou, L.; Fu, Y.P., Existence and stability of periodic quasi-solutions in nonlinear parabolic systems with discrete delays, Journal of mathematical analysis and applications, 250, 139-161, (2000) · [Zbl 0970.35004](#)

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