

AN ENERGY—TYPE INEQUALITY

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Abstract. In this paper we will prove an Energy-Type inequality for the mild solution of the linear evolution equation. And for showing the strength and power of this inequality we will use this inequality to show continuity of the solution with respect to a parameter of the semilinear evolution equation with monotone nonlinearity.

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REFERENCES

- [1] F. E. BROWDER, *Non-linear equations of evolution*, Ann. of Math., **80** (1964), 485–523.
- [2] R. F. CURTAIN AND A. J. PRITCHARD, *Infinite dimensional linear system theory*, LN in control and information sciences, **8** (1978), Springer-Verlag, Berlin-Heidelberg, New York.
- [3] G. DA PRATO AND J. ZABCZYK, *A note on semilinear stochastic equations*, Differential and Integral Equations, **1** (2) (1988), 1–13.
- [4] W. G. FARIS AND G. JONA-LASINIO, *Large fluctuations for a non-linear heat equation with noise*, J. Phys A: Math. Gen., **15** (1982), 3025–3055.
- [5] T. KATO, *Nonlinear evolution equations in Banach spaces*, Proc. Symp. Appl. Math., **17** (1964), 50–67.
- [6] A. PAZY, *Semigroups of linear operators and applications to partial differential equations*, Applied Mathematical Sciences, **44** (1983), Springer-Verlag, Berlin.
- [7] M. REED, AND B. SIMON, *Methods of modern mathematical physics I: Functional analysis*, New York, London: Academic Press 1972.
- [8] W. SMOLENSKI, R. SZTENCCEL, AND ZABCZYK., *Large deviations estimates for semilinear stochastic equations*, Proceeding of the 5th IFIP Conference on Stochastic Differential Systems, Eisenach, 1986.
- [9] H. TANABE., *Equations of evolution*. Pitman, London 1979.
- [10] B. Z. ZANGENEH, *Measurability of the Solution of a Semilinear Evolution Equation*, Seminar on Stochastic Processes, Birkhäuser, Boston, 1990.
- [11] ———, *Existence and uniqueness of the solution of a semilinear stochastic evolution equation on the whole real line*, Seminar on Stochastic Processes, Birkhäuser, Boston, 1992.
- [12] ———, *Semilinear stochastic evolution equations with monotone nonlinearities*, Stochastics and Stochastics Reports, **53** (1995), 129–174.