

LYAPUNOV PROPERTY OF POSITIVE C_0 -SEMIGROUPS ON NON-COMMUTATIVE L^p SPACES

T. PRAJAPATI, K. B. SINHA AND S. SRIVASTAVA

Abstract. That the growth bound of a positive C_0 -semigroup on classical L_p -space coincides with the spectral bound of its generator, is a well known result in classical semigroup theory. In this paper we study this result in the non-commutative setting.

Mathematics subject classification (2010): 47D06, 47D03.

Keywords and phrases: C_0 -semigroup, Lyapunov property, non-commutative L^p space, Schatten class.

REFERENCES

- [1] ARENDT, W., BATTY, C. J. K., HIEBER, M. AND NEUBRANDER, F., *Vector-valued Laplace transforms and Cauchy problems*, Second Edition, Monographs in mathematics Vol. 96, Birkhäuser, 2011.
- [2] BERGH, J. AND LÖFSTRÖM, J., *Interpolation spaces: An introduction*, Springer-Verlag Berlin Heidelberg New York 1976.
- [3] DAVIES, E. B. AND LINDSAY, M., *Non-commutative symmetric Markov semigroup*, Math. Z. 210, 379–411, 1992.
- [4] DERNDINGER, R., *Über das spektrum positiver generatoren*, Math. Z. 172, 281–193, 1980.
- [5] GREINER, G. AND NAGEL, R., *On the stability of strongly continuous semigroups of positive operators on $L_2(\mu)$* , P. 257–262, 1983.
- [6] JUNGE, M., MERDY C. AND XU, Q., *H^∞ functional calculus and square functions on non-commutative L^p spaces*, Astérisque 305, Paris: Société mathématique de France, VI+ 138 p. 2006.
- [7] KAASHOEK, M. AND LUNEL, S. M., *An integrability condition on the resolvent for hyperbolicity of the semigroup*, Journal of Differential Equations, 112, 374–406(1996).
- [8] KRIEGLER, C., *Analyticity angle for non-commutative diffusion semigroup*, London Mathematical Society.
- [9] LUNARDI, A., *Interpolation theory*, Vol.-16, Edizioni Della Normale, 2009.
- [10] MCCARTHY, C. A., *cp*, Israel J. Math. Vol. 5, pp. 249–271, 1967.
- [11] NAGEL, R., *One-parameter semigroups of positive operators*, Lecture Notes in Math. 1184, Springer-Verlag, Berlin, 1986.
- [12] NELSON, E., *Notes on non-commutative integration*, Journal of Functional Analysis 15, 103–116, 1974.
- [13] PAGTER, B., *Non-commutative Banach function spaces*, Positivity-Trends in Mathematics, Birkhäuser Verlag Basel/Switzerland, 197–227, 2007.
- [14] PISIER, G. AND XU, Q., *Non-commutative L^p spaces*, Handbook of the geometry of Banach spaces, Vol. 2, Amsterdam: North-Holland, 1459–1517, 2003.
- [15] SINHA, K. B. AND SRIVASTAVA, S., *Theory of semigroups and applications*, Text and Readings in Mathematics, 74, Hindustan Book Agency, 2017.
- [16] VOIGT, J., *Interpolation for (positive) C_0 -semigroups on L^p -spaces*, Math. Z. 118, 283–286, 1985.
- [17] WEIS, L., *The stability of positive semigroups on L_p spaces*, Proceedings of the American Mathematical Society, Vol. 123, Number 10, October 1995.
- [18] WEIS, L., *A short proof for the stability theorem for positive semigroups on $L_p(\mu)$* , Proceedings of the American Mathematical Society, Vol. 126, Number 11, 3253–3256 November, 1998.