

# RATIONAL APPROXIMATIONS OF SEMIGROUPS WITHOUT SCALING AND SQUARING

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In this project we will discuss how to find for all  $q \geq 1$  distinct complex numbers  $b_i$  and  $\lambda_i$  with  $1 \leq i \leq q$  and  $\operatorname{Re}(\lambda_i) > 0$  such that for any generator  $(A, D(A))$  of a bounded, strongly continuous semigroup  $T(t)$  on Banach space  $X$  with resolvent  $R(\lambda, A) := (\lambda I - A)^{-1}$  the expression  $\frac{b_1}{t}R(\frac{\lambda_1}{t}, A) + \frac{b_2}{t}R(\frac{\lambda_2}{t}, A) + \dots + \frac{b_q}{t}R(\frac{\lambda_q}{t}, A)$  provides an excellent approximation of the semigroup  $T(t)$  on  $D(A^{2q-1})$ .

## REFERENCES

- [1] F. Neubrandner, K. Özer, T. Sandmaier, Rational Approximations of Semigroups without Scaling and Squaring, preprint, submitted, 2011.