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## Sharp growth rates for semigroups using resolvent bounds

In this talk I will discuss some recent results from [1], concerning growth rates for strongly continuous semigroups. These results show that a growth rate for the resolvent bounds of a semigroup generator on imaginary lines implies a corresponding growth rate for the semigroup  $(T(t))_{t \geq 0}$  if either the underlying space  $X$  is a Hilbert space, or the semigroup is asymptotically analytic, or if the semigroup is positive and  $X$  is an  $L^p$ -space or a space of continuous functions. I will also discuss variations of the main results on fractional domains; these are valid on more general Banach spaces. Finally, the main theorem can be applied to obtain optimality in a classical example by Renardy of a perturbed wave equation with unusual spectral behavior.

This is joint work with Mark Veraar (Delft University of Technology).

## References

- [1] J. Rozendaal and M. Veraar, *Sharp growth rates for semigroups using resolvent bounds*, Online at <https://arxiv.org/abs/1712.00692>, 2017.