

## Scaling property for bisectorial operators and an application to averaged Black-Scholes equation

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### SUMMARY

Sectorial operators play a central role in the theory of abstract homogeneous equations. They satisfy the so-called ‘scaling property’, i.e. if  $A$  is a sectorial operator of angle  $\delta \in [0, \pi)$ , then  $A^\alpha$  is a sectorial operator of angle  $\alpha\delta$  for  $\alpha \in [0, \pi/\delta)$ . In this work, we extend this property so it covers more general functions, in particular those functions whose absolute value has fractional power-like behaviour in some sense. This result is then used to prove the well-posedness of a family of averaged Black-Scholes equations, which involve the Riemann-Liouville and Weyl fractional derivatives.

**Keywords:** sectorial operators, functional calculus, generalized Black-Scholes equation, fractional derivatives

**AMS Classification:** 26A33, 47A60, 47B12

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