

Localization of the numerical range for quasi-sectorial contractions and semigroup approximations

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We study the numerical range of *quasi-sectorial* contractions and obtain three results. Our *first* theorem gives characterization of the maximal sectorial generator A in terms of the corresponding quasi-sectorial contraction semigroup $\{\exp(-tA)\}_{t \geq 0}$. The *second* result establishes for these quasi-sectorial contractions a quite accurate localization of their numerical range. We give for this class of semigroups a new proof of the Euler operator-norm approximation: $\exp(-tA) = \lim_{n \rightarrow \infty} (I + tA/n)^{-n}$, $t \geq 0$, with the optimal estimate: $O(1/n)$, of the convergence rate, which takes into account the value of the sectorial generator angle (the *third* result).

The talk is based on a joint work with Yury Arlinskiĭ.